A COMPARATIVE STUDY OF MANUAL DILATATION OF ANUS WITH FISSURECTOMY VERSUS LATERAL SPHINCTEROTOMY IN THE TREATMENT OF CHRONIC FISSURE-IN-ANO

Dissertation submitted in partial fulfillment of the regulation for the award of M.S. Degree in General Surgery (Branch I)

THE TAMILNADU

Dr. M. G. R. MEDICAL UNIVERSITY

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CERTIFICATE

Certified that this is the bonafide dissertation done by **Dr. VARUN RAJAN** and submitted in partial fulfillment of the requirements for the Degree of M.S., General Surgery, Branch I of The TamilNadu Dr. M.G.R. Medical University, Chennai

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DECLARATION

I solemnly declare that the dissertation titled "**A COMPARATIVE STUDY OF MANUAL DILATATION OF ANUS WITH FISSURECTOMY VERSUS LATERAL SPHINCTEROTOMY IN THE TREATMENT OF CHRONIC FISSURE-IN-ANO**" was done by me from 2007 onwards under the guidance and supervision of **Prof. Dr. G. MOHAN, M.S**.

This dissertation is submitted to the TamilNadu Dr. MGR Medical University towards the partial fulfillment of the requirement for the award of M.S Degree in General Surgery (Branch I).

Place : **Dr.VARUN RAJAN**

Date :

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CONTENTS

INTRODUCTION

Anal fissure is a common problem that causes substantial morbidity in who are otherwise healthy. Anal fissure is an elongated ulcer in the long axis of lower canal. The most frequent site for anal fissure is the midline posteriorly followed by midline anteriorly. The disease is more common in men while it is uncommon in children and elderly . It causes severe pain during defaecation and rectal bleeding that stains the tissue or streaks the stools . The pathogenesis of chronic anal fissure remains incompletely understood but most are associated with a high resting anal pressure and reduced perfusion at the fissure site due to persistent hypertonia and spasm of the internal anal sphincter. Chronic anal fissure has traditionally been treated by surgery, an effective and standard procedure that results in healing in 90-95% of the cases. A number of pharmacological sphincter relaxants have been introduced and claimed to show good results but surgical treatment is frequently needed . Lateral internal sphincterotomy heals chronic anal fissures in over 90% of cases , but it is associated with potential long-term complications . Incontinence to flatus and faecal soiling are distressing complications of sphincterotomy that may occur in up to 35% of patients. Surgical techniques that preserve the anal sphincters should reduce the possibility of postoperative faecal incontinence. This study was designed to study the hypothesis that chronic anal fissures unresponsive to conservative treatment may be regarded as unstable scar tissue. Manual anal dilatation with fissurectomy to create a fresh surgical wound might then allow stable wound healing.

AIMS OF THE STUDY

1. To compare the efficacy of manual anal dilatation with fissurectomy against lateral internal sphincterotomy in the treatment of chronic fissure-in-ano.

2. To compare the complications associated with both the procedures.

3. To decide on the better treatment of chronic anal fissure based on the findings from the study.

REVIEW OF LITERATURE

ANATOMY OF THE ANAL CANAL

The anus is the outlet of the gastro-intestinal tract. It is a slit in its resting period. It is expandable, conforming to the size and shape of the fecal content, and it normally varies from 1.2 to 3.5 cm in diameter in the act of defecation. The anus is surrounded by the subcutaneous muscle of the external sphincter. Fibers from the conjoined longitudinal muscle sphincter and its fibroelastic extensions pass into, through and around the subpecten with its glands, lymphatics and capillary network that is of great importance in anorectal suppurative processes. This is the zone of anastamoses between the superior hemorrhoidal and inferior hemorrhoidal plexuses, and to a lesser extent, the middle hemorrhoidals. The pecten's vascular anastamosis drains freely to either the portal or caval systems. Changes in the nerve supply and lymphatic drainage, also takes place at this zone. The pecten marks the area of greatest narrowing of this region.

The anorectal line (dentate, pectinate, valvular, papillary etc.) marks the upper irregular margin of the pecten . Anal papillae are more often absent than present, but when present, they do not usually arise from the free edges of the anal valves or crypts as some suppose. They correspond usually to the rectal columns of

Morgagni . The tips of the papillae frequently project above the lower margins of the rectal columns and are referred to as anal papillae.

According to Gorsch, the anal crypts , a.k.a. anal pockets, sinuses, Saccules of Harner etc.; are tiny recesses projected between adjacent anal columns and behind the anal valves. They vary in number, depth, and shape. The more constant and larger crypts are usually just lateral to the posterior commissure and are regularly described as an etiological factor in anal fissure and fistulae. The blind ends of the crypts extend into the pecten and the proximal open ends are directed toward the rectum.

The Anal Valves

The so-called anal valves are folds of squamous epithelium bridging adjacent anal columns from the free inner wall of anal crypts . Histologically, the valves are thickened or cornified epidermis, which becomes continuous with the rectal columnar epithelium projected distally between the anal columns into the blind end of the crypts.

Fascia

Gorsch describes the relations of the anal canal in detail. Anteriorly in the male the anal canal is in relation with the perineal body and the accumulated concentrations of fascia at this point. From below and upward, these include the superficial and

deep layers of the superficial fascia, Colle's Fascia, at its attachment to the posterior margin of the triangular ligament, in which lie the adjoining superficial transverse perineal muscles of the bulb of the urethra, the superficial and deep layers of the triangular ligament, and finally, the rectourethralis muscle, forming the floor of the prerectal space.

In the female, the anal canal lies posteriorly in relation to the sphincter vaginae (Bulbocavernosus) muscle and the ill-defined posterior margin of the triangular ligament, the rectovaginal muscle, which forms the floor of the rectovaginal space (septum), or the prerectal space which is located just above the deep portion of the external sphincter.

Laterally, the anal canal, covered by anal fascia, comes into relation with the wider ischiorectal fossae with its fibro-cellular matrix. Posteriorly, the anal canal is in relation with the anococcygeal body, which through its muscular and fascial reflections, contributes materially to structural support.

THE EXTERNAL SPHINCTER

The external sphincter is formed by three striated muscles :

1.The Subcutaneous
2.The Superficialis
3.The Profundus

The Subcutaneous Muscle

This portion of the external sphincter is situated immediately below the transitional anal skin (transiderm). The bulk of the muscle is usually annular and disposed somewhat to or on the same longitudinal plane with the internal sphincter. It forms the lower wall of the anal canal. Occasionally it presents small posterior extensions, continuous with the strong converging legs of the superficialis muscle. Anteriorly, it may decussate with the bulbocavernosus and the retractor scroti. In the female anteriorly, it is continuous with the sphincter vaginae.

The upper and inner margin is separated from the lower edges of the internal sphincter by prominent insertions of the fibroelastic extensions of the conjoined longitudinal muscle. This forms the intersphincteric line. The subcutaneous muscle lies in a septal network formed by the fibro-elastic muscle, and interweaves with the subcutaneous, presenting support. These terminal extensions into the skin form the corrugator cutis ani.

The Superficialis Muscle

This is an elliptical band of muscle fibers , which embraces the anal canal at the level of the internal sphincter. It is the largest, longest and strongest portion. Arising from the sides of the coccyx and forming the important muscular component of the anococcygeal body, its diverging halves surround the mid-portion of the anal canal. In the male anteriorly, they converge and insert into the

central tendinous raphe. In the female, they diverge and fuse with the sphincter vaginae. Anteriorly also, crossing fibers extend laterally into the fascial shelf and attach to the ischial tuberosity and adjacent fascia.

In both sexes, the anterior and posterior communicating spaces extend directly above the superficialis fibers, and below the profundus muscle.

The Profundus Muscle

This portion of the external sphincter is situated immediately above the superficialis muscle. The fibers are usually annular. Occasionally, uncrossed fibers extend posteriorly to reach the anococcygeal ligament.

Anteriorly, the profundus forms the upper margin of the anorectal muscle ring, but posteriorly the puborectalis muscle forms the upper margin of this ring. The profundus lies in close relation to the legs of the levator and a common crossed arrangement of the entire muscle, extends to the opposite ischial tuberosity on either side.

THE CORRUGATOR CUTIS ANI MUSCLE

This muscle represents the terminal insertions of the fibro-elastic extensions of the longitudinal muscle into the anal canal and perianal skin. The extensions seem to

penetrate the substance of the subcutaneous muscle as well as passing on either side of this muscle.

THE INTERNAL SPHINCTER

The terminal portion of the circular muscle coat of the rectum gradually thickens to become the component of the internal sphincter. This muscle is surrounded by the superficialis portion of the external sphincter and forms the entire inner muscular layer of the wall of the anal canal . Immediately below its lower margin, the internal sphincter is separated from the upper border of the subcutaneous by the prominent insertions of the longitudinal muscle, forming the intermuscular septum of the intersphincteric line. Overlying the internal sphincter is the pecten, covered by squamous epithelium with subjacent areolar tissue containing lymphatics, crypts, preformed anal glands, capillaries and nerves.

The anal canal measures from 1.5-2.5 cm anteriorly in length, 2-3 cm in length laterally, and 3-4 cm in length posteriorly.

THE LONGITUDINAL MUSCLE

An attenuation of the anterior and posterior longitudinal bands, and tinea of the sigmoid form the longitudinal muscle coat of the rectum, which spread out to surround the inner circular muscle coat. At the anorectal junction, the longitudinal coat becomes fibro-elastic in character, fuses with the levator and fascial

extensions and becomes the longitudinal muscle . This fascial arrangement fixes and protects the anal canal and acts as a tendon sheathe for the divisions of the anal musculature.

MILLIGAN'S SEPTUM

Milligan describes a septum of fascia, Milligan's Septum , which extends from the lower border of the internal sphincter muscle and turns outward below the superficialis and above the subcutaneous muscles, to be inserted into the ischial tuberosity and the skin. Posteriorly, the septum is incomplete.

According to Stanton, the intermuscular sulcus readily palpated in the anal canal is located at the level of Milligan's septum, in the space between the subcutaneous and internal sphincter muscles. It is a depression formed by the retraction of the skin of the canal by the pull of the insertions of the conjoined longitudinal muscle. It encircles the canal and serves as a landmark in diagnosis and treatment.

THE ANORECTAL MUSCLE RING

The levator ani muscle, in conjunction with the profundus portion of the external sphincter, forms a combined musculo-fascial ring , which completely surrounds the anorectal junction.

Posteriorly, the puborectalis division of the levator ani reinforces the anal canal,

and this forms the posterior and upper margin of the anorectal ring.

Anteriorly, it decreases until there remains only a thin sheath of reflector levator fibers called the Junction of Luschka. In the anterior quadrant, only the profundus portion of the external sphincter forms the anorectal muscle ring.

THE ANOCOCCYGEAL LIGAMENT OR BODY

This is a firm composite musculo-fascial structure extending from the posterior aspect of the anal canal to the tip and sides of the coccyx , on the lower sacrum. Into it fuses the strong insertions of the glutei muscles, the ischiococcygeus, the pubococcygeus, and the puborectalis muscles, (all at different levels) the superficialis fibers, and finally, the terminal posterior extensions of the combined longitudinal muscle and superficial fascia.

Inferiorly it is bounded by the skin. Superiorly its fascial stratum is the supra anal fascia, which supports the rectal ampulla.

THE LEVATOR ANI MUSCLE

The levator ani is comprised of many muscular coalescing parts . Four principal paired muscles forming the levator are described as the pubococcygeus, the puborectalis, the iliococcygeus and ischiococcygeus.

The Pubococcygeus Muscle

The pubococcygeus has as its origin, a common origin with the puborectalis, the posterior surface of the pubic arch and the arcus tendineus. The main portion of the pubococcygeus continues posteriorly along with the puborectalis and is interlaced to a point of being inseparable, until the pubococcygeus passes around the rectum and continues to its insertion into the anococcygeal body, the coccyx, and the lower sacrum. Fibers of pubococcygeus intermingle with the fibroelastic extensions of the conjoined longitudinal muscle, to become part of the corrugator cutis ani.

The Puborectalis Muscle

This muscle arises practically in common with the pubococcygeus, but on a slightly lower plane. Owing to the fact that the puborectalis and pubococcygeus, as they pass posteriorly, the fibers intermingle and continue to do so until the puborectalis begins to swing on the posterior side of the rectum, to encircle the rectum and become part of the anorectal muscle ring. Damage to the puborectalis, more than any other of the anorectal muscle ring, may result in fecal incontinence.

The Iliococcygeus Muscle

The Iliac portion of the levator arises from the fascial covering of the obturator internus muscle and is directed posteriorly and medially, converging somewhat with the pubococcygeus as they conjointly insert into the coccyx and lower sacrum. This muscle supports the anorectal shelf in the act of defecation.

The Ischiococcygeus Muscle

This muscle is covered with the same fascial planes from the pubococcygeus and iliococcygeus. It originates from the ischial spine and adjacent sacro-iliac fascia. It attaches to the coccyx, the lower sacrum and the median portion of the sacro-tuberous ligament. The combined levators fix the pelvic structures and present a fulcrum against which increased abdominal pressure may be exerted in the acts of lifting, coughing, defecation, urination, coitus, and various other activities.

NEUROPHYSIOLOGY OF THE ANAL CANAL

Physiologically, Gorsch states that defecation is best explained on the basis of a modified somatic autonomic reflex, normally under cortical control, and in which the desire to defecate may be conveniently distinguished from the act of defecation. The so-called "trigger zones" at which the initial sensory stimuli arise and produce the desire to defecate, are probably in the rectal musculature as well as in the anorectal line, which is the more important trigger zone. Threshold stimuli arise normally from the anorectal junctional area and are conveyed by the spinal sensory nerves, to initiate the active phase of defecation. The distention of the rectal wall also gives rise to some extent, to the desire to defecate through the sympathetic afferent nerves. This results reflexely, in a relaxation of the anal

sphincters, particularity the internal, and a contraction of the rectal musculature. The act may be inhibited by the will.

On the other hand, voluntary relaxation of the anal sphincters with voluntary contraction of the colon and its complementary muscles, with the expulsion of the rectal contents, is the actual act of defecation.

In adult life, defecation is no longer a reflex, but normally becomes a voluntary act, once the summation of sensory stimuli is effected. It becomes a purely reflex act, however (sympathetico-parasympathetic), in the autonomic innervated rectum, following destruction of its cerebral connections.

The broad subject of constipation is directly related to the sensorimotor response of the entire gastrointestinal tract as well as those of the rectum.

"Trigger zones" may be entirely extrarectal and in pathologic conditions, provoke a constant tenesmus leading to rectal prolapse. Further, the sensory and motor dispersions, before, after, and during the act of defecation are complex and may be reflected throughout the entire nervous system, e.g., fainting, abdominal cramping, orgasms, and neurocirculatory phenomena, are common clinical observations.

Defecation may also be entirely a cortical response. Central stimulation of the vagus produces the defecation reflex, a contraction of the rectum and a relaxation of the anal sphincters.

In this regard, it may be observed that the segmental movements of the intestines are considered myogenic in origin, and the intrinsic plexuses of Meissner and Auerbach control that peristalsis . The autonomic system (sympathetic and parasympathetic) subserves a regulatory function. Diarrhea may be entirely an intrinsic myogenic basis.The anal canal,which has a mean length of 4 cm,lengthens with squeezing of the external sphincter and shortens with straining. Resting pressure , or tone, which depends largely on the internal sphincter , averages 90 cm water.It is lower in women and older patients than in men and younger patients. The principal mechanism that provides continence is the pressure differential between the rectum(6 cm water) and the anal canal(90 cm water).

FISSURE – IN – ANO

Anal fissure is the most common cause of severe anal pain. It is equally one of the most common reasons of bleeding per anus in infants and young children. The pain of anal ulcer is intolerable and always disproportionate to the severity of the

physical lesion. It may be so severe that patients may avoid defecation for days together until it becomes inevitable. This leads to hardening of the stools, which further tear the anoderm during defecation, setting a vicious cycle. The fissures can be classified into 1] Acute or superficial and 2] Chronic fissure in ano.

Predisposing Factors - It has been proved that constipation is the primary and sole cause of initiation of a fissure. Passage of hard stool, irregularity of diet, consumption of spicy and pungent food, faulty bowel habits, and lack of local hygiene can contribute for initiation of the pathology. In females, the ailment is usually triggered during pregnancy and following childbirth. It occurs as a superficial split in the anoderm that may heal by itself or may progress to a chronic fissure.

The anoderm is more adherent to the underlying tissue in the posterior midline. The sphincter fibers form Y-shaped decussation in the posterior

midline that is anchored to the mucosa. Blood supply to the anoderm at the

posterior midline is significantly lower .The reduced blood supply to the lesion is indicated by the absence of granulation tissue at the base of the fissure and a very slow growth of the anoderm even when the traditional conservative treatment eases the trauma due to hard faeces.

A well-developed idiopathic anal fissure rests directly over the internal sphincter and the circular fibers of this sphincter are visible on the floor of the fissure on naked eye inspection. The internal sphincter undergoes a perpetual state of spasm due to irritation and hypertrophies.

Clinical evaluation

Anal fissures are usually seen in the midline posteriorly.These lesions truly involve just the anal tissues and are typically best seen by visually inspecting the anal verge with gentle separation of the gluteal cleft.Location may vary, and an anterior midline fissure is seen more often in women ,although most fissures in women and men reside in the posterior midline.Characteristic associated findings include a sentinel pile or tag externally and an enlarged anal papilla internally.Fissures away from these two locations should raise the possibility of associated diseases , especially Crohn's disease,hidradenitis suppurativa , or STDs. Because it involves

the highly sensitive squamous epithelium , fissure in ano is often a painful condition. With defaecation , the ulcer is stretched ,causing pain and mild bleeding.

The diagnosis is secured by the typical history of pain and bleeding with defaecation, especially if associated with prior constipation and confirmed by inspection after gently parting the posterior anus. Digital as well as proctoscopic examination may trigger severe pain , interfering with the ability to visualize the ulcer. An endoscopic examination should be performed , but it can be delayed 4 to 6 weeks , until the pain is resolved with medical management or until surgery is performed for those cases refractory to medical therapy.

Pathogenesis

The exact cause of anal fissures is unknown but many factors appear likely , such as the passage of large,hard stools , which may be the initiating factor; inappropriate diet ;previous anal surgery; childbirth and laxative abuse. Numerous authors have documented higher than normal resting anal canal pressures and reduced anal blood flow in the posterior midline.It is therefore believed that anal fissures are the result of anal sphincter hypertonia and subsequent mucosal ischaemia. New information regarding the pathogenesis of anal fissures has led to the introduction of several new medical approaches ,including the application of nitric oxide donors(nitroglycerine) , calcium channel blockers(diltiazem and

nifedipine) and botulinum toxin injections ,all of which allow for internal sphincter relaxations.

Treatment of superficial fissures:

It has long been recognized that superficial fissures can be cured conservatively.

The following methods are usually advocated for such type of simple fissures.

1. Warm water sitz bath with or without adding boric powder, povidone iodine solution, or potassium permanganate in the water. This treatment soothes the pain and relaxes the spasm of the internal sphincter for some time.
2. Adequate analgesia is necessary to break the vicious cycle of pain viz. avoidance of defecation for prolonged periods leading to hard stools resulting in further tearing of the anoderm and thereby inviting increased pain. A suitable dose of analgesic consumed half an hour before going for defecation gives a good amount of post defecation pain relief.

3. Stool softening is essential as soft and formed stools negotiate the rectum and anal canal in non-traumatic physiologic maneuver. Plenty of oral fluids also help in keeping the stools soft.

4. High-fiber-diet and laxatives such as dulcolax; green leafy vegetables and fibrous fruits go a long way in increasing the bulk of stool leading to a smooth and swift act of defecation.

5. Reassurance and encouragement for not resisting the urge for defecation help prevent hard stools.

6. Application of local anesthetic cream or gel may help avoid the torture experienced in passage of stools in the patients with acute fissures. Ointments containing opiates, xylocaine, amethocaine, and cinchocaine to relieve pain, belladonna to alleviate sphincter spasm and silver nitrate to promote healing have been in vogue since long. These mixtures are introduced on the finger or a short rectal bogie to ensure a thorough application over the desired part of the fissure. The modern practice is to insert the ointment over an anal dilator, which in addition helps relieve sphincter spasm. The possible complications of this treatment include pruritus due to allergy with the anesthetic agents and loss of anal dilator in the rectum.

Chronic or complicated fissure in ano:

The above mentioned approaches do not prove effective in the chronic variety of fissures in ano. These chronic or complicated fissures are not amicable to the aforesaid simple conservative line of treatment. A definitive therapy is needed to

tackle this stubborn malady. The fissure is labeled as chronic or complicated if it fulfills the following criteria.

1. If not responding to conservative treatment.
2. If a fibrous anal polyp is present.
3. Presence of an external skin tag is noticed.
4. Presence of hemorrhoid is visible.
5. Induration is indicated at the edges of fissure.
6. If there is exposure of the fibers of the internal sphincter at the floor of the fissure.
7. The base of fissure is infected.
8. A bridged fissure with underlying fistula [a post fissure fistula] is diagnosed.

It has been experienced that fissure, complicated by any of the above factors, neither heal spontaneously nor does it respond to conservative therapy.

Various therapies advocated for treating these chronic fissures and which are presently in practice have been summed up in the following paragraphs. Such proven therapies may be grouped into non-operative and operative maneuvers.

Non-operative techniques:

1] Injection of Botulin Toxin- Botulin toxin is known to cause paresis of the sphincter and thus 20 Units of type A botulinum toxin [Botox] diluted to 50 U/ml

is injected bilaterally to the fissure. The toxin exerts its effects on the acetylcholine releasing parasympathetic peripheral nerve endings as well as the ganglionic nerve endings, thereby leading to flaccid paralysis of the internal sphincter. This causes sphincter paresis for about 3 months, a period which is sufficient for healing of a chronic non-complicated [not associated with sentinel tag, internal hemorrhoids, anal polyps or post fissure fistula] fissure.

It is well tolerated and can be administered on an outpatient basis. The healing rate reported is about 79%.

Drawback- The toxicity of the drug, accidental injection in the surrounding tissue amounting to general poisoning, haematoma and infection reported had discouraged regular use of this therapy.

2] Oral Nifedipine- Nifedipine is an L-type calcium channel antagonist. L-type calcium channels are the principal calcium channels in the GI smooth muscles. It has been used with variable effects in the management of achalasia cardia. In the treatment of anal fissures, 20 mg of Nifedipine is given twice daily. Nifedipine is found effective in relieving the sphincter spasm. It is known for achieving increase in the local blood supply by an independent mechanism. This allows faster healing.

Drawback- It is, however, supposed to cause reversible internal anal sphincterolysis. Most of these drugs have a short duration of action and need to be administered 2-3 times daily. Similarly, side effects like headache, palpitations, flushing, dizziness, colicky abdominal pain, ankle edema, reduced taste and smell, nausea and diplopia have been reported.

3] Local application of vasodilators— Nitric oxide is an important neurotransmitter mediating internal anal sphincter relaxation. It has been proved that chronic anal fissure is ischemic in origin due to poor blood supply and spasm of internal anal sphincter.

Nitric oxide donors such as glyceryl trinitrate [GTN] or isosorbide dinitrate are known to cause a chemical sphincterotomy leading to healing of fissure.

A 2%GTN ointment applied twice to the anoderm for 6 weeks results in a complete healing in 98% of patients. A few patients do experience mild headache during therapy.

In another study, topical diltiazem ointment was used as an agent for chemical sphincterotomy for chronic anal fissure. The study claims to offer significant healing rate and reduced incidences of side effects.

Drawbacks- However, during the course of therapy, strict dietary restrictions to smoothen the stool are necessary. Headache during therapy is a major concern with the incidence as high as 20- 100%. Though the application of GTN has a high healing rate; it also has a high recurrence rate.

4] Direct current probe treatment- This method is tried in patients of chronic anal fissures with associated internal hemorrhoids. A study claimed that when the DC probe [Ultroid, Homeron] was applied to the internal hemorrhoids, the patients were relieved of anal pain and healing occurred in 90% of patients.

Drawbacks- However, this mode of treatment requires special equipment and the procedure takes a very long time to be performed [about 10minutes for each hemorrhoid]. Moreover, the mechanism of action on the part of fissure is also not understood. A case of complication in the form of perianal abscess and fistula requiring surgery has been reported following DC probe treatment.

5] Endoscopic anal dilatation- In this procedure, anal dilatation is performed with a two-valved anoscope under local anesthesia as an office procedure. This procedure is said to be free of discharge or defect of continence either transient or permanent. In a series, a Parks' retractor or a recto sigmoid balloon has been used for sphincter dilatation. Out of 495 patients treated through this procedure, it is

reported that in as many as 87- 88% of the patients, the fissures were healed within 3 months .

Drawback- As many references are not available in support of this technique, it will be hazardous to comment on the efficacy or otherwise of this procedure.

6] Chemical cauterization- This is done by using silver nitrate or phenol-in-glycerine. This procedure may be repeated a couple of times until healing occur. It takes about 4 to 8 weeks for complete healing of the fissure.

Drawbacks- The toxicity of the drugs, accidental injection in the surrounding tissue amounting to general poisoning, hematoma and infection reported refrained the surgeons from regularly resorting to this method.

Operative techniques :

7] Stretching of anal sphincter [Lord's anal dilatation] - Anal dilatation was described by Recamier in 1838. This was one of the most favoured and accepted methods of treating the anal fissures . The primary cause of attraction for the procedure is its extreme simplicity. Since almost no instruments are needed for this procedure, it could be performed at the primary health centers or inadequately equipped hospitals situated at small townships.

Anal dilatation helps in healing of the fissure by reducing the anal canal pressure. If performed with due care by avoiding excessive manipulation, it does not cause any damage to the external anal sphincter as feared. In experienced hands, incontinence of stools or flatus is seldom seen.

Drawback- However, recent studies have shown that anal dilation has a higher risk of fissure persistence and higher risk of incontinence. Although the procedure in itself is curative, in cases with associated pathologies, it has to be supplemented with an additional procedure.

8] Excision of the anal fissure [fissurectomy] - A triangular part of the anoderm is excised along with the fissure itself. This procedure is usually preceded by anal stretch.

Drawback- Howsoever good and reliable this operation is, it leaves behind a large and rather uncomfortable external wound, which takes a long time to heal.

9] Fissurectomy with immediate skin grafting- To expedite healing and shorten the convalescence, application of a split thickness graft to the wound is advocated by a section of the proctologists.

Drawbacks- The procedure is a time consuming, rather finicky one. It needs a hospital stay of about a week to keep patients bowel held up to avoid possible detachment of the graft. Precisely, for these reasons, the procedure could not get enough acclamation and acceptance.

10] Internal anal sphincterotomy - Internal anal sphincterotomy to relieve the sphincter spasm is presently considered the preferred therapy for chronic, recurrent and non-healing fissures.

Two techniques have been described:

A. **Open posterior internal sphincterotomy.** Posterior sphincterotomy is done by dividing the sphincter fibers through the fissure wound.

   Drawbacks- The wound is slow to heal and has a tendency to lead to a posterior midline keyhole defect that may cause a persistent seepage or difficulty in continence.

B. **Lateral subcutaneous internal sphincterotomy.** It is one of the most favoured procedures. The reasons for this are the simplicity of the procedure, minimal anesthesia requirements, and good results. The lists of complications that can arise due to the procedure are formidable; but with careful and experienced hands these could be effectively handled and the procedure could be made safe and simple.

Drawbacks- The most common complications encountered are bleeding needing hospitalization, abscess and fistula formation, incontinence to flatus and feces, and recurrence.

Both the procedures can be done either under a local or a general anesthesia depending upon personal preference of the surgeon based on his experience and the attitude of the patient.

11] Combined outpatient surgical and cyrotherapeutical treatment- A lateral anal sphincterotomy, which is done under local anesthesia, is followed by fissure curettage with N protosside cryosound . This is claimed to be a quicker and more effective procedure.

Drawback- The additional maneuver is not found to be of any specific advantage and so it has not found many takers.

12] Carbon dioxide laser surgery- It involves laser vaporization of the fissure locally. The internal sphincter can be incised using this laser. In long-standing fissures, some degree of anal stenosis is present. It can be used to give relieving incisions in the three quadrants other than the fissure before the fissure is attended.

Drawbacks- The high cost of the laser unit seems to be the major deterrent in its wider acceptance.

13] Lateral subcutaneous internal sphincterotomy and radio frequency surgery- In an attempt to improve on the available options, a fusion of method of sphincterotomy with radiofrequency is described. The procedure has been claimed to be effective in cases where the fissure is associated with pathologies like sentinel tags, hypertrophied anal papillae, fibrous polyps, post fissure fistula or internal hemorrhoids which can be tackled simultaneously while the fissure is being treated.

The radio frequency surgical unit used is Ellman Dual Frequency 4MHz by Ellman International [Hewlett, NY], which incorporates threefold function of cutting, cutting and coagulation or pure coagulation.

It is claimed that the edges of the fibrosed fissure can be refashioned with the help of the radio frequency surgery. The entire procedure is quick and is virtually bloodless.

Drawbacks- Being a new introduction with no controlled or randomized trials available, this treatment modality needs further studies to analyze long-term results.

RELEVANT STUDIES

1. Comparison Of The Results Of Fissurectomy Versus Lateral Internal Sphincterotomy In The Surgical Management Of Chronic Anal Fissure

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Methods: Sixty-two consecutive patients with sequential sampling were divided into two groups. Thirty patients underwent fissurectomy and 32 underwent lateral internal sphincterotomy. After a median follow-up of 22 months, they compared the results of the two procedures. In addition to frequent visits on a predetermined basis, a telephone inquiry into fissure recurrence and continence status was made.

Results: All patients in either group were pain-free and without bleeding within one week. In both groups, urinary retention was noted in one patient. Incontinence to flatus occurred in two patients (6.2%) in the LIS group, but no incontinence was noted in the F group. There was one patient (3.1%) with fissure recurrence in the LIS group, but no one in F group. No patient in either group was afflicted with anal stenosis or perianal infections. All wounds healed within 8 weeks. Twenty-nine patients (96.6%) in the F group and 28 (87.5%) in the LIS group reported satisfactory results.

Conclusion : In surgical treatment of chronic anal fissures not responding to conservative management, fissurectomy may be a sphincter-sparing alternative and perhaps a preferable surgical technique.

2.Internal sphincterotomy for chronic anal fissure: Long term effects on anal pressure

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ABSTRACT:

In 28 patients with chronic anal fissure the median anal canal pressure was 98

cmH_2O, significantly higher than in control subjects ($P < 0{\cdot}001$). After lateral internal sphincterotomy the pressure dropped by 50 per cent to normal levels and the fissures healed with no change in pressure over 12 months. Ten patients also had normal anal pressures and were asymptomatic 4-6 years after internal sphincterotomy. Adequate internal sphincterotomy appeared to reduce permanently anal canal pressure, suggesting that abnormal activity in the sphincter contributes to the development of a fissure.

3.Faecal incontinence in patients with anal fissure: A consequence of internal sphincterotomy or a feature of the condition?

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Methods: This prospective study included a review of all patients operated upon by the authors who performed division of the internal sphincter at or below the upper limit of the fissure. A questionnaire was completed by each patient before surgery and then after surgery with regard to any degree of incontinence such as soiling of underclothes, control of flatus and accidental bowel motion.

Results: 126 patients with chronic anal fissure were studied. The male to female

ratio was 0.8:1. Minor degrees of incontinence were present prior to surgery in 35 patients (28%) and in 31 (25%) patients after surgery, the majority of them were incontinent before surgery.

Conclusion: Based on the results of this study, minor degrees of incontinence could be a symptom of chronic anal fissure and not the sequelae of lateral internal sphincterotomy.

4.Surgical treatment of chronic anal fissure

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This is a retrospective study of 1753 cases of chronic anal fissures treated by five varying methods over a five-year period from January 1976 to December 1980. Results showed that the incidence of recurrent fissures was higher in those treated by anal fissurectomy with sphincterotomy. There was also a significant difference in operative time, length of hospital stay, patient discomfort, and incidence of urinary retention among these operative methods. Generally, lateral anal sphincterotomy and multiple anal sphincterotomies showed a lesser incidence of these factors. A simpler procedure, such as lateral anal sphincterotomy or multiple anal sphincterotomies, is the treatment of choice for chronic anal fissure. However, a chronic anal fissure associated with symptomatic enlarged hemorrhoids may have a similar result when treated with hemorrhoidectomy and fissurectomy as a combined procedure.

5.Long-term results of lateral internal sphincterotomy for chronic anal fissure with particular reference to incidence of fecal incontinence.

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Division of Colon and Rectal Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minnesota 55905, USA.

Methods: Between 1984 and 1996, 585 patients underwent lateral internal sphincterotomy and were surveyed by questionnaire. Eighty-three percent (487/585) responded. The mean follow-up was 72 (range, 6-145) months.

Results: Fissures had healed by a median of three weeks after surgery in 96 percent of patients. Recurrent fissures occurred in 8 percent. Two thirds of the recurrent fissures healed on conservative management alone. Ninety-eight percent of patients were satisfied with the outcome of surgery, but some degree of fecal incontinence occurred in fully 45 percent of patients at some time in the postoperative period. Incontinence occurred in 53.4 percent of women and 33.3 percent of men ($P < 0.05$). Incontinence to flatus, mild soiling, and gross incontinence occurred in 31, 39, and 23 percent of patients, respectively. However, by the time of survey (a mean of >5 years after lateral internal sphincterotomy) 6 percent reported incontinence to flatus, 8 percent had minor fecal soiling, and 1 percent experienced loss of solid stool. Importantly, only 3 percent of patients

stated that incontinence had ever affected their quality of life.

Conclusion: Although lateral internal sphincterotomy heals and relieves symptoms of chronic anal fissure in nearly all patients (96 percent), incontinence occurs frequently. Most episodes of incontinence are indeed minor and transient, but in a small subgroup, incontinence seems to be permanent.

6.Results of lateral internal sphincterotomy for chronic anal fissure with particular reference to quality of life.

Menteş BB, Tezcaner T, Yilmaz U, Leventoğlu S, Oguz M.

Department of Surgery, Colorectal Surgery Unit, Gazi University Medical School,Ankara, Turkey.

Methods: Adult patients with chronic anal fissure underwent lateral internal sphincterotomy with the open technique. Two hundred forty-four patients completed the Gastrointestinal Quality of Life Index questionnaire at admission and at 12 months postoperatively. The Fecal Incontinence Severity Index score was calculated preoperatively and at 2 and 12 months postoperatively. The Fecal Incontinence Quality of Life Scale was administered to any patient who had a Fecal Incontinence Severity Index score greater than 0 at 12 months

postoperatively.

Results: The mean preoperative Gastrointestinal Quality of Life Index score was 118.34 +/- 6.33, which developed to 140.74 +/- 2.38 postoperatively ($P < 0.001$).

At the two-month follow-up, 18 patients (7.38 percent) had a Fecal Incontinence Severity Index score greater than 0. By 12 months, the number of patients with Fecal Incontinence Severity Index score greater than 0 was reduced to seven (2.87 percent). These seven patients had a Gastrointestinal Quality of Life Index score similar to that of the group with postoperative Fecal Incontinence Severity Index score of 0, and only three patients (1.22 percent) had evident deterioration in the Fecal Incontinence Quality of Life Scale. The 12-month total Gastrointestinal Quality of Life Index score of the three patients who developed anal abscess/fistula after sphincterotomy (139.33 +/- 3.21) was similar to the Gastrointestinal Quality of Life Index score of those without complications. However, the Gastrointestinal Quality of Life Index score of the recurrent cases (111.53 +/- 3.53) was apparently low.

Conclusion: The gastrointestinal quality of life improved significantly following lateral internal sphincterotomy, regardless of the surgical complications or postoperative disturbances of continence. Only 1.2 percent of the patients experienced deterioration in Fecal Incontinence Quality of Life Scale.

7.A study of fecal incontinence in patients with chronic anal fissure: prospective, randomized, controlled trial of the extent of internal anal sphincter division during lateral sphincterotomy.

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Department of General Surgery, Theodore Bilharz Research Institute, Giza, 12411, Giza, Egypt.

Methods: One hundred eight patients with chronic anal fissure were prospectively studied before and after lateral internal sphincterotomy. A questionnaire was completed for each patient before and after surgery with regard to any degree of fecal incontinence. Fecal incontinence severity index was assessed using the Cleveland Clinic Incontinence Score. The patients with preoperative perfect continence were randomized into two groups (46 patients in each group): Group 1 underwent traditional lateral internal sphincterotomy (up to the dentate line) and Group 2 were underwent a conservative internal anal sphincterotomy (up to the height of the fissure apex or just below it).

Results: Minor degrees of incontinence were present before surgery in 16 patients (14.8%). Results of the randomized trial revealed that temporary postoperative incontinence was newly developed in 6/92 of patients (6.52 %) who did not have it before surgery. Five of the six (10.86%) were in Group 1 one (2.17%) was in Group 2 ($p = 0.039$). Persistent incontinence occurred in two in Group 1 (4.35%). All of them were females. All have had a history of one or more vaginal

deliveries.

Conclusion: A mild degree of fecal incontinence may be associated with chronic anal fissure at presentation rather than as a result of internal sphincterotomy. Troublesome fecal incontinence after lateral internal sphincterotomy is uncommon. Sphincterotomy up to the dentate line provided faster pain relief and faster anal fissure healing, but it was associated with a significant postoperative alteration in fecal incontinence than was sphincterotomy up to the fissure apex. Care should be exercised in female patients with a history of previous obstetric trauma, as internal anal sphincter division may further compromise sphincter function.

8.Anal sphincter function after treatment of fissure-in-ano by lateral subcutaneous sphincterotomy versus anal dilatation. A randomized study.

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Twenty patients with chronic anal fissure were randomized into two groups. Ten patients were treated with lateral subcutaneous sphincterotomy and 10 with anal dilatation. Anal dilatation was carried out preoperatively, and at 1 and 3 months after the operation in all patients. Preoperatively there was a significantly increased maximal resting pressure in the 20 fissure patients (80 mmHg median) compared with 20 control subjects (50 mmHg median). Postoperatively a

significant decrease in pressure occurred in the dilated group (49 mmHg median p less than 0.05), whereas the pressure was not significantly reduced in the group that underwent sphincterotomy (65 mmHg median p less than 0.05). At 1 year three patients complained of recurrent symptoms of anal fissure in the dilated group compared with one in the sphincterotomy group. Minor continence disturbance was noted in two patients in both groups.

9.Lateral subcutaneous sphincterotomy versus anal dilatation in the treatment of fissure in ano in outpatients: a prospective randomised study.

Jensen SL, Lund F, Nielsen OV, Tange G.

Fifty eight patients with idiopathic chronic anal fissure were included in a randomised prospective trial of lateral subcutaneous sphincterotomy versus simple anal dilatation carried out as outpatient procedures. Operations were performed under local anaesthesia and the patients reviewed 10-30 months later (median follow up time 18 months). Altogether 30 patients were treated by lateral subcutaneous sphincterotomy and 28 by anal dilatation. No serious complications were observed in either group. One recurrence was observed in the group treated by sphincterotomy, whereas eight occurred in the other group (p less than 0.05). Functional results with respect to impaired control of flatus and soiling of underwear were significantly better after sphincterotomy (p less than 0.002). It was concluded that lateral subcutaneous sphincterotomy is the treatment of choice

for idiopathic chronic anal fissure resistant to conservative measures.

10.Results of Lateral Internal Sphincterotomy with Open Technique for Chronic Anal Fissure: Evaluation of Complications, Symptom Relief, and Incontinence with Long-Term Follow-Up.

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The aim of this study was to investigate the results of open lateral internal sphincterotomy (LIS) and the recurrence and incontinence rate, to perform a long-term assessment of incontinence and to assess complications and relief of symptoms. This clinical prospective study was undertaken in patients undergoing open LIS. One hundred and twenty-nine patients entered the study. Mean duration of pain relief was 1.2 +/- 0.4 days and mean time before defecation without pain was 1.9 +/- 1.0 days. Complication rate was 41.8%. They found that urine retention was seen frequently in males. They demonstrated that open LIS up to the dentate line does not have a higher rate of incontinence. Incontinence after LIS was only to flatus and two-thirds of these resolved in 6 weeks. No patient showed improvement of incontinence after 6 weeks.

11.Chronic anal fissure: results of the surgical treatment of 220 patients

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Since results from non-surgical procedures designed for treatment of chronic anal fissure are still controversial, sphincterotomy remain as the "state of the art" therapy for this condition. In a retrospective basis, the authors intended to review results from treatment of chronic anal fissure in 220 patients who underwent surgical procedure between 1984 and 1995. Data from chart review included age, sex, location of the lesion at the canal anal, associated anorectal disease, delivered surgical technique and complications. Seventy per cent of the patients were male. Mean age was 37.1 years. Fissure was located at the posterior midline in 86.1%. Associated anorectal conditions occurred in 41.4%. Fissurectomy plus posterior sphincterotomy was the treatment of choice in 84.1%. Complications occurred in 5 (2.3%) cases. There were no incontinent patients. Mean follow-up was 2.6 years. The authors concluded that partial internal anal sphincter section produces excellent results in treatment of chronic anal fissure. Posterior sphincterotomy may persist effectively and safely since continence impairment was not identified in the present study.

12.Management of the anal fissure: a comparison between lateral internal sphincterotomy with manual dilatation of anus

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Design: It was a comparative study of randomly selected sample of 50 patients.

Purpose: To compare the results of lateral internal sphincterotomy with manual dilatation of anus under general anaesthesia in the management of fissure in ano in terms of relief of symptoms, post operative complications.

Place & Duration of study: Patients presented to Surgical unit, Bahawal Victoria Hospital, Bahawalpur from 15-02-2002 to 14-02-2004.

Material & methods: This was a prospective type of comparative study. The patients of fissure in ano were randomly divided into two groups. Group A patients were treated by lateral sphincterotomy & Group B patients were treated by manual dilatation of anus under anesthesia. Follow up protocol was also maintained. Patients were examined and evaluated according to the comparison criteria which were (Relief of symptoms, Complications developed, Recurrence & Healing of fissure).

Result: Out of these 50 patients, 32 were male and 18 female. In Group-A, 92% of patients were completely cured, 4% of patients developed retention of urine while 4% of patients developed post-operative bleeding. The success rate was

92%. In Group-B, success rate was 72% out of remaining 8% developed incontinence of flatus, 8% developed incontinence of faeces, 4% developed retention of urine while haematoma was observed in 4% of cases.The data was analysed with "SPSS" on computer, Standard Error of Difference Between Two Proportions was applied. Chi square test was applied and P value found to be 0.04 which was less than 0.05 (Statistically insignificant).

Conclusion: On the basis of this study, it was concluded that the results of Lateral Internal Sphincterotomy in the management of anal fissure is safer and more effective than manual dilatation of anus under anaesthesia.

13.Lateral internal sphincterotomy V/S anal dilatation

Ann King Edward Med College

Department of Surgery, Fatima Jinnah Medical College, Lahore

Objective: To compare the two surgical procedures performed for the treatment of fissure in ano.

Design: Clinical trial Setting: Surgical Unit-III, Sir Ganga Ram Hospital, Lahore.

Subjects and Methods: Sixty female patients coming to the out door and emergency department of Sir Ganga Ram Hospital, were included in the study.

Thirty patients had open lateral internal sphincterotomy (LIS) and 30 had anal dilatation (AD).

Results: LIS was associated with remarkably low incidence of post operative complications. The patients undergoing AD had more pain and bleeding per rectum in the postoperative period. Anal incontinence was seen in 59.6% of patients, prolapse of haemorrhoids in 40% and recurrence in 6.6% operated for AD, while the corresponding figures for LIS were 6.6%, 10% & 0% respectively ($p<0.05$).

Conclusion: LIS is a superior procedure to AD for the surgical treatment of fissure in ano. LIS should be adopted as a procedure of choice in uncomplicated fissure in ano.

14.Chronic Fissure-in-Ano; Lateral internal Sphincterotomy vs Manual dilatation of Anus

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Allied/ DHQ Hospitals (PMC), Faisalabad,Pakistan

Aims and Objectives: (1) To compare the effectiveness of manual dilatation of anus and lateral internal sphincterotomy in chronic anal fissure. (2) To calculate the complications rate i.e. incontinence, and recurrence of disease in two procedures.

Setting: Allied/ DHQ Hospitals (PMC) Faisalabad.

Period: From August 1999 to September 2001.

Design: A prospective randomized study.

Materials and Methods: Consecutive forty patients (Male-26, Female-14) irrespective of age and sex were included in this trial, after taking written informed consent. The diagnosis of chronic fissure-in ano was made on the basis of typical clinical features. The diagnosis was confirmed on examination under anaesthesia (EUA). Sigmoidoscopy was done in all cases to look for evidence of any associated disease. Biopsy of the fissure was taken to sort out the aetiological factors like tuberculosis, Crohn`s disease and carcinoma.

Randomization: Patients having odd serial number were treated by manual dilatation of anus and patients having even serial numbers were dealt with by lateral internal sphincterotomy either under spinal or general anaesthesia. A follow-up was done for 3,6 and 12 weeks.

Technique: Patients having chronic fissure-in-ano were admitted in the ward from outpatient department. MDA was performed as described by Watts et al. Lateral internal sphincterotomy was always performed on the left lateral side with the patient in the lithotomy position. Patients were followed-up regularly at intervals of 3,6 and 12 weeks. At follow-up, symptoms were assessed on a pre-designed questionnaire. Statistical evaluation was done by t-test.

Conclusion: Lateral internal sphincterotomy is the treatment of choice in patients

with chronic fissure-in-ano resistant to conservative measures. It has no permanent side effects and is well tolerated.

15.Fissurectomy with maximal anal dilatation . A viable alternative for the surgical correction of chronic fissure/ulcer-in-ano.

Bode WE, Culp CE, Spencer RJ, Beart RW Jr.

A series of 121 patients with chronic fissure-in-ano who underwent fissurectomy with maximal anal dilatation was studied. The mean follow-up was 8.1 years. Minor problems with anal competence occurred after the operation in 30 patients (25 per cent). Within two months, this problem had resolved in all patients. One patient (0.8 per cent) had a true recurrence. Five patients (4.1 per cent) had recurrent acute anal abrasions as the result of passage of a hard stool. These healed spontaneously. Twelve patients (9.9 per cent) had fragile scars, but this was a significant problem in only five (4.1 per cent). No patient had significant stricture formation, keyhole deformities, or major persistent problems with anal competence. The patients graded their operations with regard to satisfaction: 118 (97.5 per cent) reported satisfactory results and three (2.5 per cent) reported unsatisfactory results. This study shows that fissurectomy with maximal anal dilatation is a viable approach to the surgical management of chronic fissure-in-ano.

MATERIALS AND METHODS

Design of the study : A prospective study

Place where the study was conducted : Department of General Surgery

Coimbatore Medical College Hospital

Study Period : June 2007 to October 2009

Study Population : Patients with chronic anal fissure from all surgical units (S1 to S6) who were not responding to conservative management.

Sample size : 120

Inclusion criteria : Patients with chronic anal fissure not responding to conservative management either presenting as fissure alone or associated with haemorrhoids and fistula-in-ano.

Exclusion criteria : Patients with either of the following :

a. Tuberculosis
b. Multiple anal fissures
c. Anorectal abscesses
d. Anal malignancies

e. Immunocompromised patients
f. Previous history of faecal incontinence or anal stenosis
g. Patients who have undergone previous anal surgeries
h. Patients with history of bleeding diathesis
i. Patients with history of urinary retention due to urological causes.
j. Patients with history of diabetes or hypertension

Preoperative evaluation :

Patients with chronic anal fissure were admitted in the respective surgical units. Most of the fissures were in the posterior midline. They were thoroughly evaluated by doing all the basic blood investigations(Hb%,random blood sugar,blood urea,serum creatinine),ECG and plain radiograph of the chest PA view. Examination of the anal region was done . Proctoscopic examination was done to visualize the fissure and associated haemorrhoids if any. Per rectal examination was carried out. Patients were excluded on the basis of the above criteria. Those patients fitting into the inclusion criteria were planned for surgery after anaesthetic assessment.

Pre-operative preparation :

Patients posted for surgery were put on liquid diet 24 hours before surgery. They were put on nil by mouth 10 hours prior to surgery. Patients were administered soap and water enema on previous night and the morning of surgery.

Anaesthesia :

Patients were administered general or regional anaesthesia as deemed fit by the theatre anaesthesiologist.

Operative procedures :

Either of the two were carried out after obtaining informed consent.

a. *Manual dilatation of the anus with fissurectomy* :

The patient was placed in the lithotomy position. Manual anal dilatation was done to a maximum of four fingers.This was followed by excision of the fissure complex with a margin of healthy mucosa and scar tissue down to the level of the internal sphincter . Sphincterotomy was not carried out. As such,a fresh ulcer without any fibrous scar tissue was established to precipitate its healing capacity. Tight T-bandage was applied after dressing.

b. *Lateral sphincterotomy* :

The patient was placed in the lithotomy position. The intersphincteric groove was palpable at the anal verge.The procedure was carried out through the open method. A 1 to 2 cm circumferential incision was made over the free edge of the internal sphincter.Blunt dissection was used to open the plane

inside and outside the internal sphincter to free it.The free lower edge of the internal sphincter was then grasped,drawn into the wound and its distal portion was divided. The sentinel skin tag at the outer end of the fissure was excised. Tight T-bandage was applied after dressing.

Post-operative care :

Patients were allowed oral intake of fluids 6 hours after surgery. Complications of urinary retention were watched for and recorded. Dressing was removed on the first post-operative day.They were started on normal diet. Warm sitz baths were advised and bulking agents were prescribed. They were usually discharged on the second post-operative day with the above recommendations.

Follow-up :

The first visit was scheduled within one week. The second visit was scheduled the subsequent week. Further follow-up was scheduled 6 weeks after the previous visit. This was to be followed by monthly visits. During each visit, enquiries were made regarding the expected complications. Patients were also examined to rule out anorectal sepsis. Results of the follow-up were tabulated and analysed.

Limitations of the study :

The most striking limitation was the long term follow-up. Patients usually came for review until the first month after surgery. Later many patients defaulted. But there were no recurrences or any of the major complications such as faecal incontinence or anal stenosis.

OBSERVATION AND ANALYSIS

All patients with chronic anal fissure were admitted and treated in the six surgical units of Coimbatore medical College Hospital. They were followed up and their complications were recorded and analyzed.

Table 1 : Distribution of surgeries

Operation	*Number of patients*
Lateral sphincterotomy	88
Manual anal dilatation with fissurectomy	32

88 patients(73.3%) of the total 120 patients underwent lateral sphincterotomy(LIS). 32 patients(26.67%) of the total 120 patients underwent manual anal dilatation with fissurectomy(MAD+F).

Table 2 : Age Distribution in the two groups

Age/Operation	*LIS*	*MAD+F*	*Total*
<20 years	4	2	6
20-39 years	59	23	82
>40 years	25	7	32
Total	88	32	120

6 patients(5%) were below 20 years. 82 patients(68.33%) were between 20 and 39 years. 32 patients(26.67%) were above 40 years.

Table 3 : Sex distribution in the two groups

Sex/Operation	*LIS*	*MAD+F*	*Total*
Male	36	16	52
Female	52	16	68
Total	88	32	120

52 patients(43.33%) were males.

68 patients(56.67%) were females.

Table 4 : Distribution of associated diseases in both the groups

Condition/Operation	*LIS*	*MAD+F*	*Total*
Haemorrhoids	23	9	32
Fistula-in-ano	2	0	2
Total	25	9	34

32 patients of 120(26.67%) had an associated haemorrhoids.

2 patients of 120 had a fistula-in-ano.

Table 5 : Pain in both the groups

Persistence of pain	*LIS*	*MAD+F*	*Total*
Present	30	24	54
Absent	58	8	66
Total	88	32	120

54 patients of 120 complained of persistent pain. Remaining 66 had no pain.

Of the 54 who had pain, 30 patients belonged to lateral sphincterotomy group and 24 belonged to the fissurectomy group.

Table 6 : Bleeding in both the groups

Persistence of bleeding	*LIS*	*MAD+F*	*Total*
Present	19	9	28
Absent	69	23	92
Total	88	32	120

28 patients of 120 complained of persistent bleeding. Remaining 92 had no bleeding.

Of the 28 who had bleeding, 19 patients belonged to the sphincterotomy group and 9 belonged to the fissurectomy group.

Table 7 : Incontinence to flatus or faecal soiling

Incontinence to flatus or faecal soiling	*LIS*	*MAD+F*	*Total*
Total	0	0	0

There were no reports of incontinence to flatus or motion among the two groups.

Table 8 : Infection(abscess or fistula)

Infection	LIS	MAD+F	Total
Total	0	0	0

There were no reports of infection(abscess/fistula) among the two groups.

Table 9 : Anal stenosis

Anal stenosis	*LIS*	*MAD+F*	*Total*
Total	0	0	0

There were no reports of anal stenosis among the two groups.

Table 10 : Retention of urine

Urinary retention	*LIS*	*MAD+F*	*Total*
Present	18	12	30
Absent	70	20	90
Total	88	32	120

30 patients of the 120 developed urinary retention.

Of them, 18 belonged to the sphincterotomy group and 12 belonged to the fissurectomy group.

Table 11 : Recurrences

Recurrences	LIS	MAD+F	Total
Total	0	0	0

There were no reports of recurrences among the two categories.

DISCUSSION

120 patients admitted with chronic anal fissure were admitted and operated during the study period. They were followed up to a maximum of 2 months. During this period, they were followed up to know whether they developed any complications. Complications were recorded and tabulated.

The majority of the patients underwent lateral sphincterotomy , accounting for almost 73.3% of them .The rest underwent manual anal dilatation with fissurectomy (26.67%). A vast majority were females (56.67%) – differing from other studies. Most of the patients fell in the age group between 20 and 39 years (68.33%). This was followed by people above 40 years (26.27%). A meagre 5% accounted for the age group less than 20 years.

Associated diseases like haemorrhoids and anal fistula were also treated along with the surgery for anal fissure. Haemorrhoids accounted for the majority (26.67%). Only two patients presented with a low fistula-in-ano. For these two patients, lateral sphincterotomy was done along with fistulectomy.

Urinary retention , usually , the most common complication after such surgeries was seen incidentally in 30 patients of the operated 120. This accounted for 25%. However , among those who developed such a complication , the majority fell in the lateral sphincterotomy group (around 18 patients) compared to the other group which had only 12 patients. There seemed to be an increased incidence of urinary retention among the lateral sphincterotomy group. So the same data was subjected to a Chi square test to test the significance of relationship between the incidence of urinary retention and the surgery performed. The test

revealed that there was no significant relationship between urinary retention and the operation which was performed ($p<0.05$).

Pain persisted in 45% of the patients after surgery. Among these patients, the majority fell in the lateral sphincterotomy group. But on closer observation, it was found that 75% of the patients who had undergone manual anal dilatation with fissurectomy developed pain whereas only 34% of the 88 who had undergone lateral sphincterotomy group developed pain. Hence a Chi square test was resorted to check this discrepancy. The test revealed that there was a higher chance of pain developing in patients who underwent manual anal dilatation with fissurectomy as compared to those who underwent lateral sphincterotomy ($p<0.001$).

Bleeding was noticed in 28 patients of the 120 who were operated. 19 patients had undergone lateral sphincterotomy compared to 9 who underwent manual anal dilatation with fissurectomy. But the latter group accounted for higher percentage (28.13% out of 32) compared to the earlier group which had a lower incidence (21.6% of 88). Again, a Chi square test was done to see whether bleeding was higher in manual anal dilatation with fissurectomy. The test refuted this hypothesis . Thus no significant relationship was found between the chance of persistent bleeding and manual anal dilatation with fissurectomy ($p<0.05$).

No patient in either group developed incontinence to flatus or faecal soiling. Similarly ,no patient in either group suffered from anal stenosis or perianal infections.

No recurrences were reported from either of the two groups among

the followed up patients.

Recent studies have shown that lateral internal sphincterotomy is detrimental to the continence mechanism. Hence, an alternative procedure was resorted to. But no significant differences were found between the two procedures except for the fact that there was a higher chance of pain persisting in patients undergoing manual anal dilatation with fissurectomy.

Statistical examinations reveal no major significant differences between the two groups of patients. This may be due to the smaller number of patients. Larger series are needed to accurately compare these two different techniques.

SUMMARY AND CONCLUSIONS

- 120 patients with chronic anal fissure who were not responding to conservative management were subjected to either of two procedures : lateral sphincterotomy against manual anal dilatation with fissurectomy.
- 88 of them underwent lateral sphincterotomy and 32 underwent manual anal dilatation with fissurectomy.
- Patients were followed up after surgery to look for complications.
- Persistence of pain was significantly higher in manual anal dilatation with fissurectomy as compared to lateral sphicterotomy ($p<0.001$).
- There were no significant differences in the chances of bleeding or urinary retention developing in either group.
- No incontinence, anal stenosis or anal infections were reported.
- No recurrences from both the procedures were reported.
- It can be concluded that given the lower rate of complications but for the higher chances of pain , manual anal dilatation with fissurectomy might be considered as an alternative procedure in the surgical management of chronic anal fissures. However,much remains to be done regarding its long term results through more extensive and larger clinical trials.

Figure 1: The rectum and anal canal.

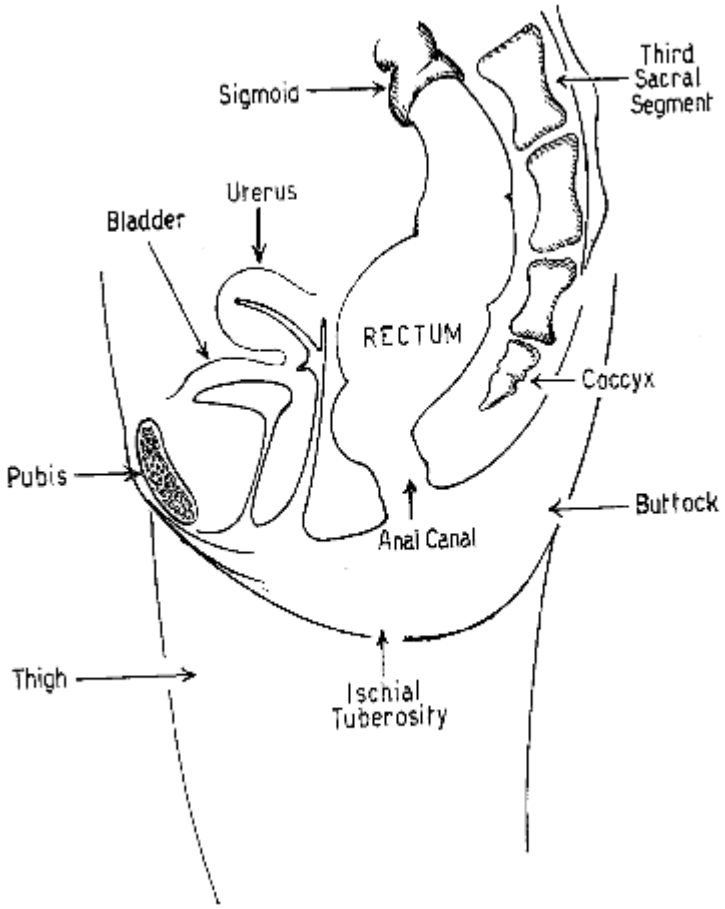


Figure 2: The anus, showing the subcutaneous muscle.

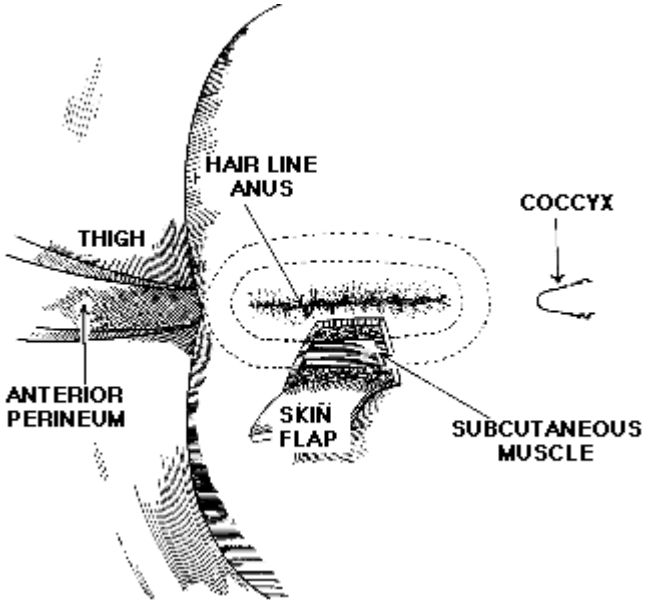


Figure 3: Conjoined longitudinal and corrugator cutis ani muscles.

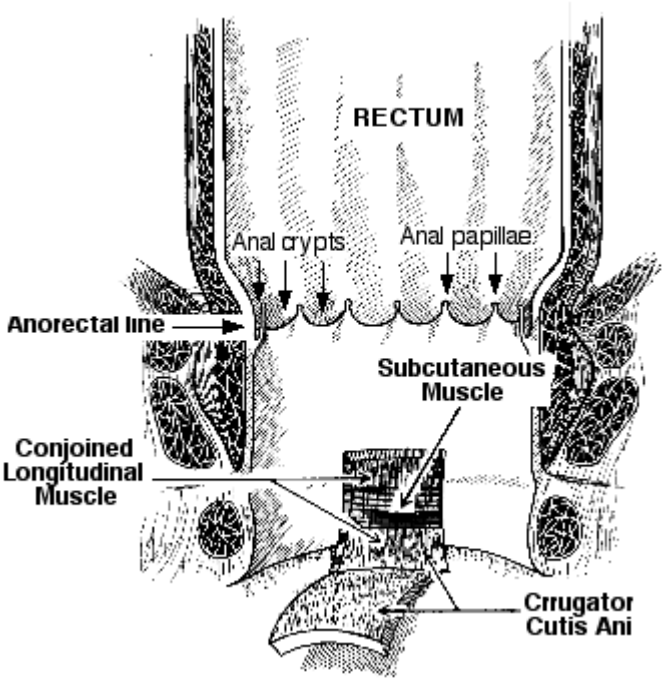


Figure 4: Papillae, crypts and Morgagnian columns.

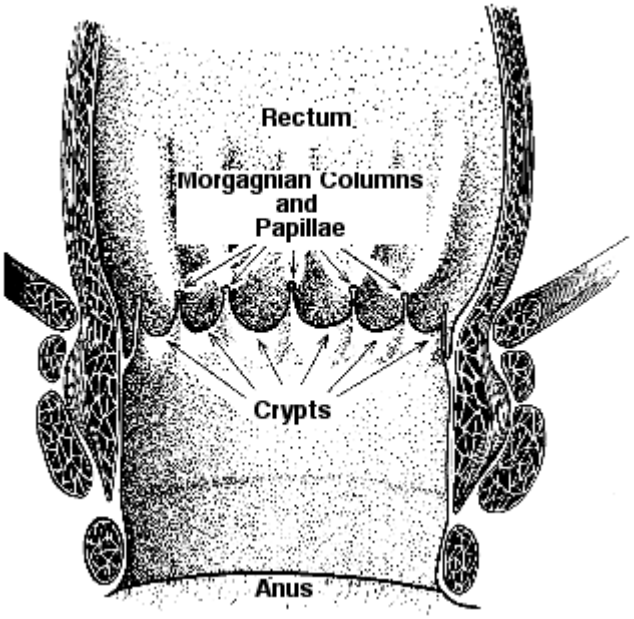


Figure 5: Muscles and fasciae.

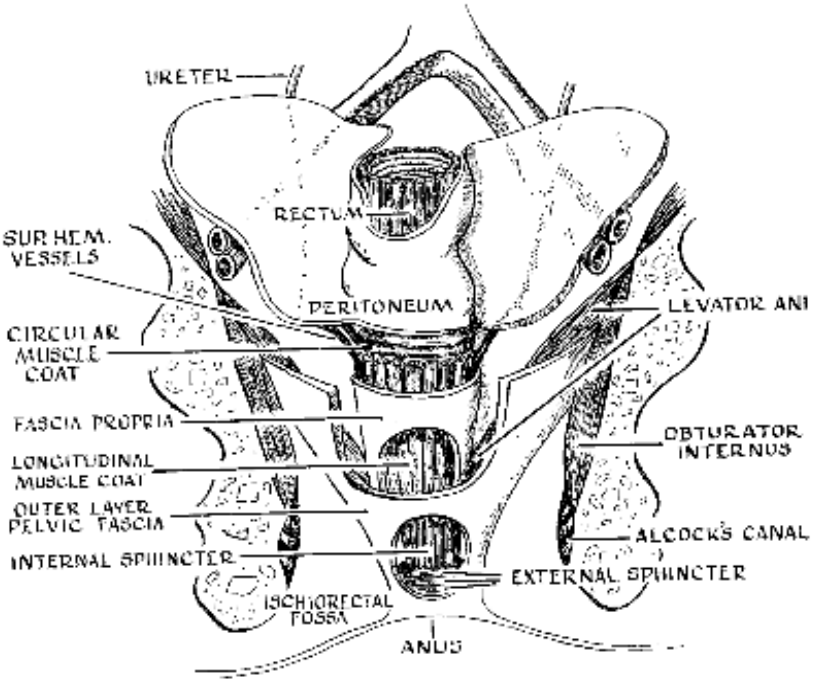


Figure 6: Coronal section showing anorectal muscles.

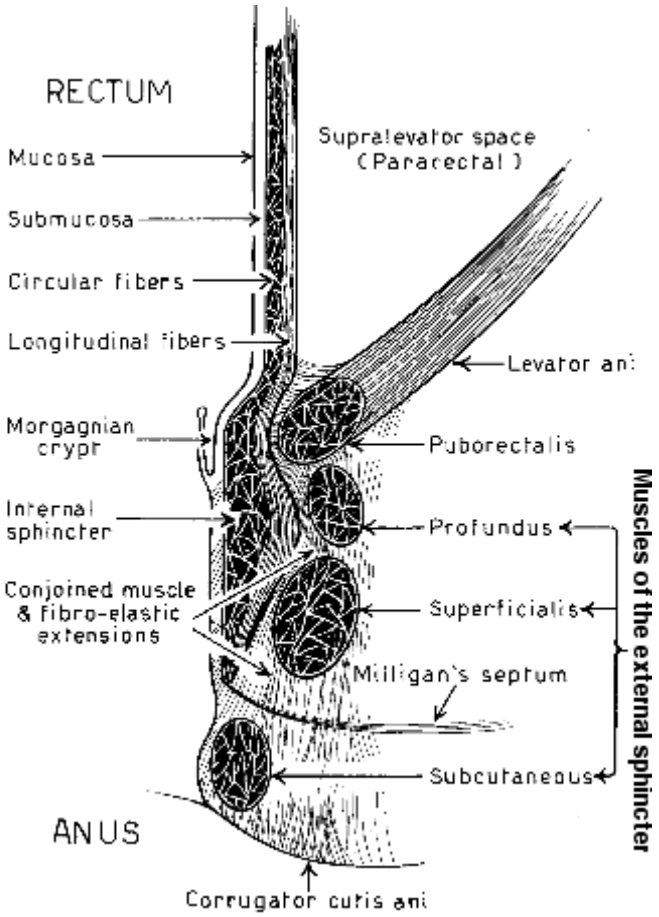


Figure 7: Schematic drawing showing the posterior pull of the superficialis muscle and the anterior pull of the puborectalis muscle, in the conscious control of the rectal outlet.

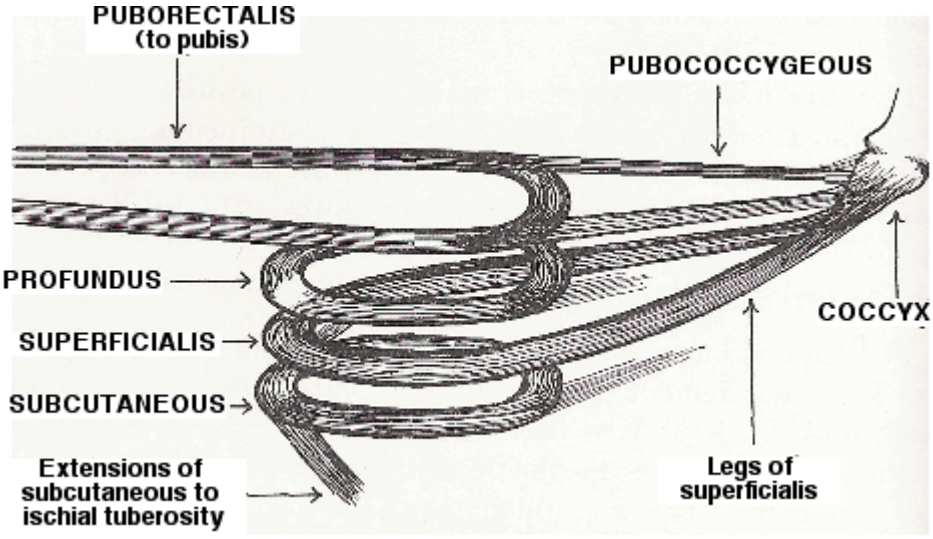


Figure 8: The intermuscular sulcus.

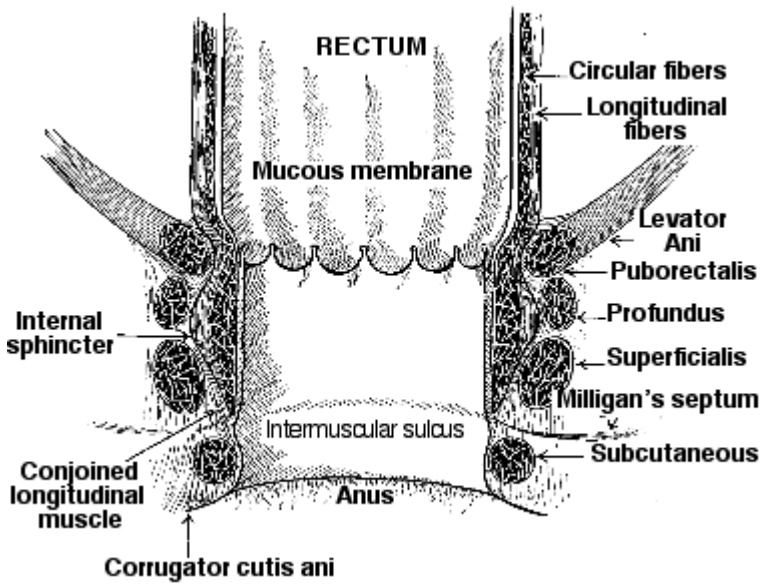


Figure. 9: This drawing shows the muscles, superficialis, and subcutaneous pulled laterally to show the profundus above and the levator plate.

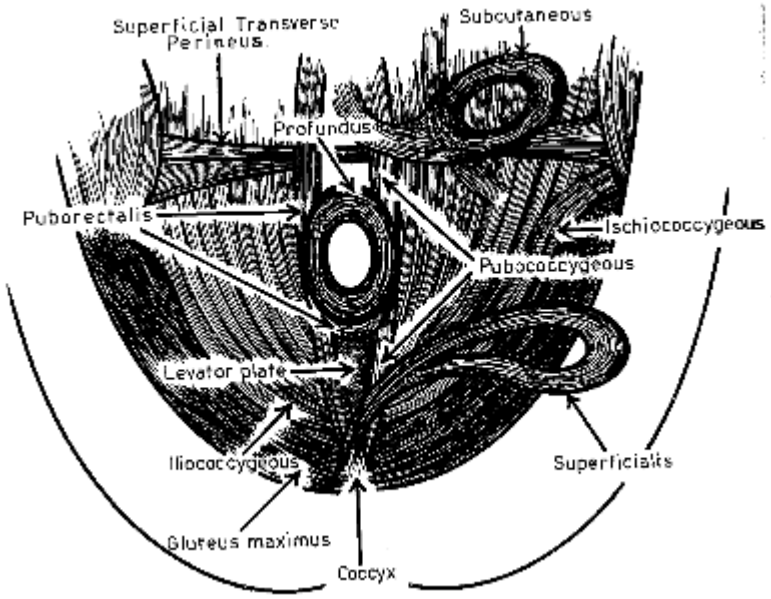


Figure 10: The vertical dotted line illustrates the plane relationship of the anterior limit of the pubis with the anterior, superior spine of the ilium.

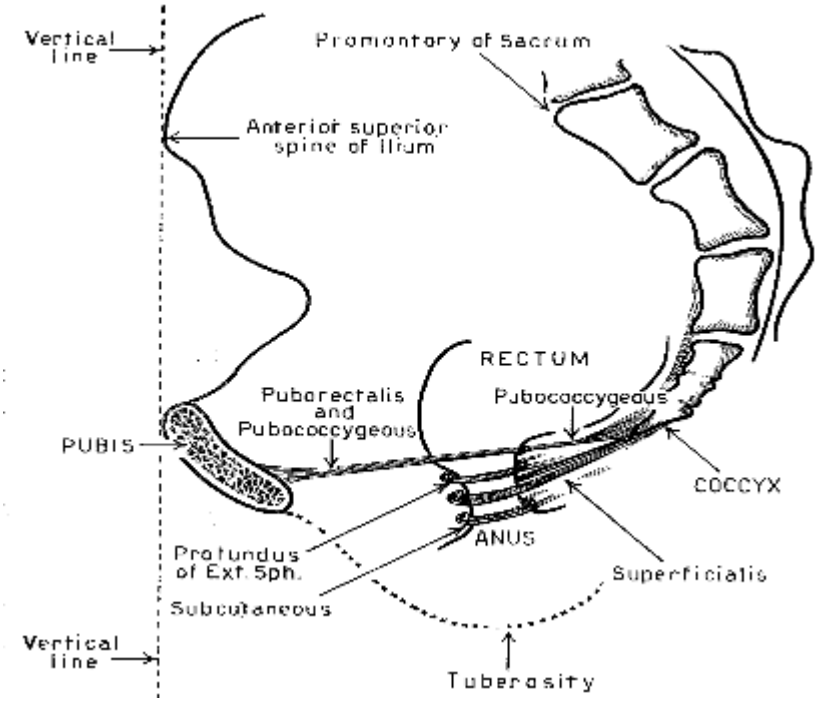
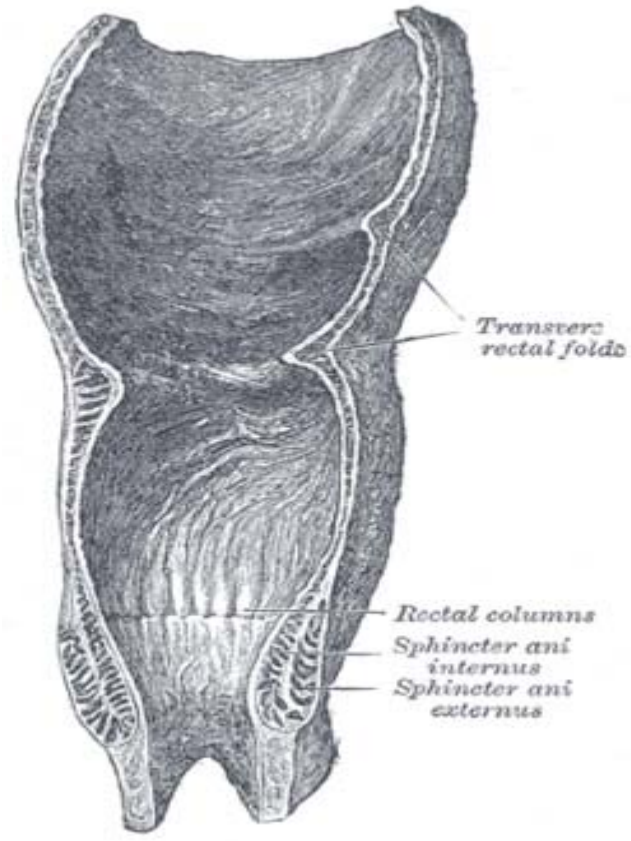
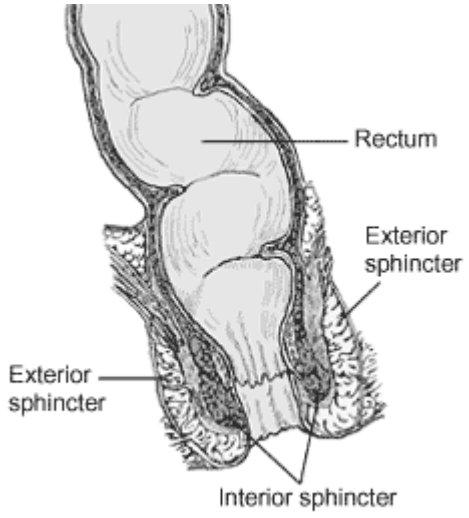


Figure 11: A view of the sphincters

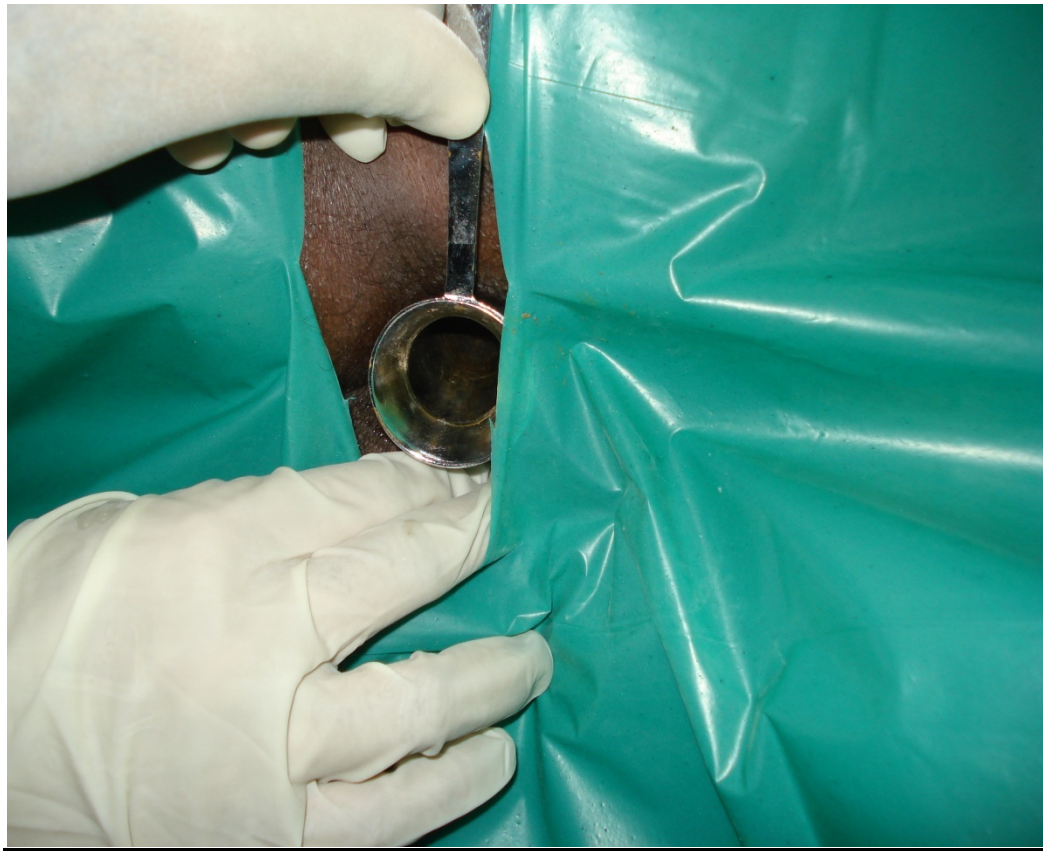




PICTURE 1 : VIEW OF ANAL FISSURE

PICTURE 2 : PER RECTAL EXAMINATION

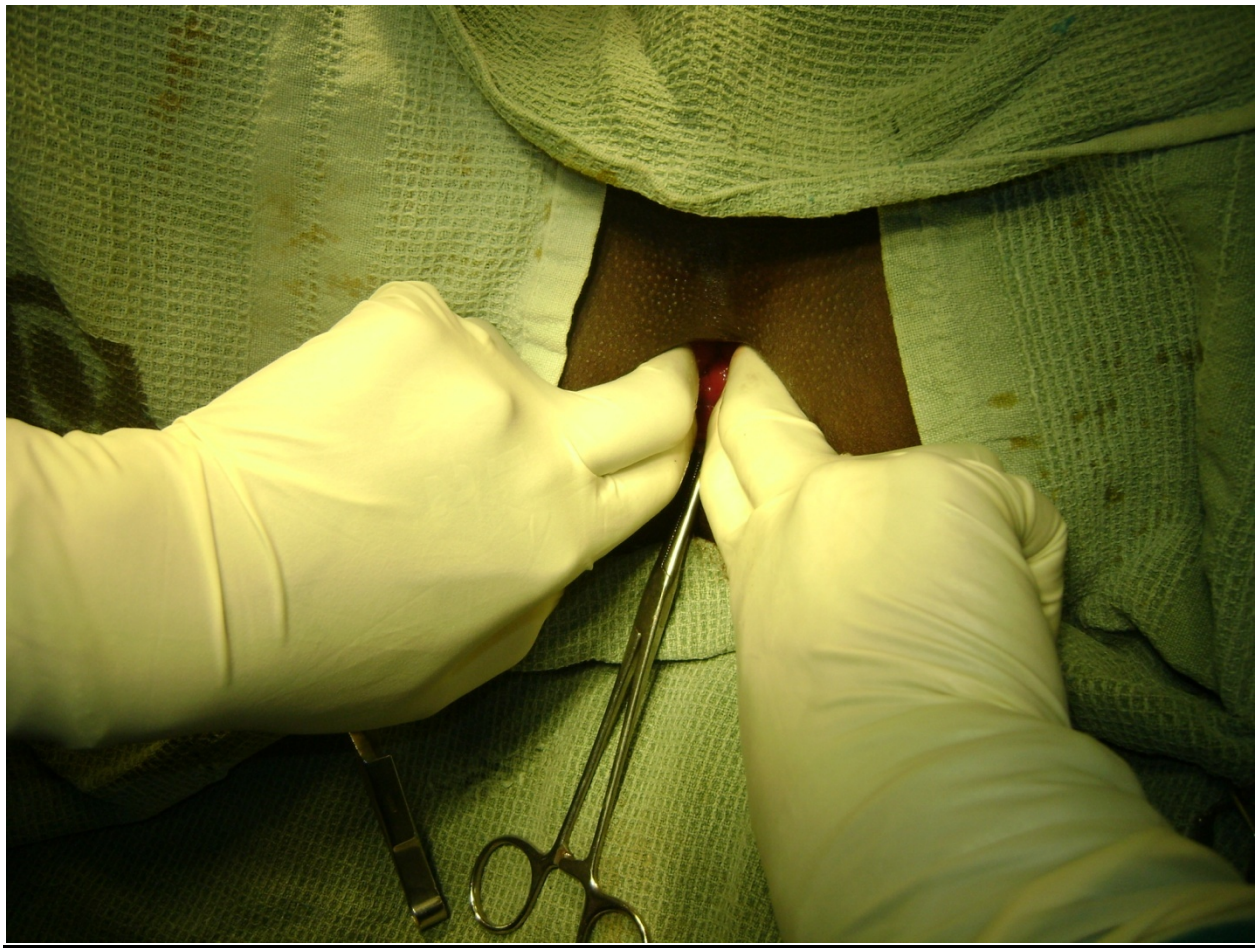
PICTURE 3 : PROCTOSCOPIC EXAMINATION



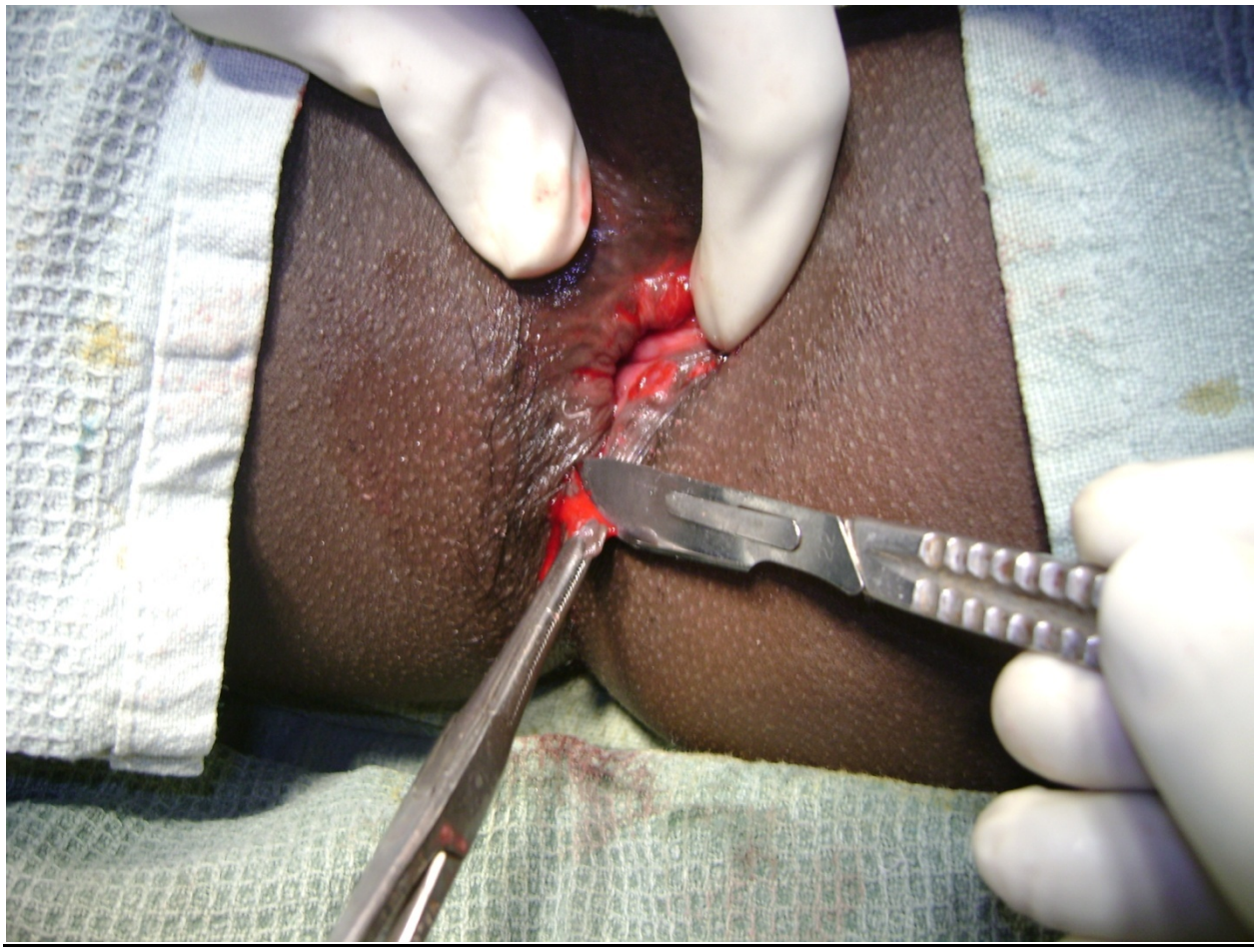
PICTURE 4 : PROCTOSCOPIC VIEW

PICTURE 5 : PER-OPERATIVE VIEW OF ANAL FISSURE

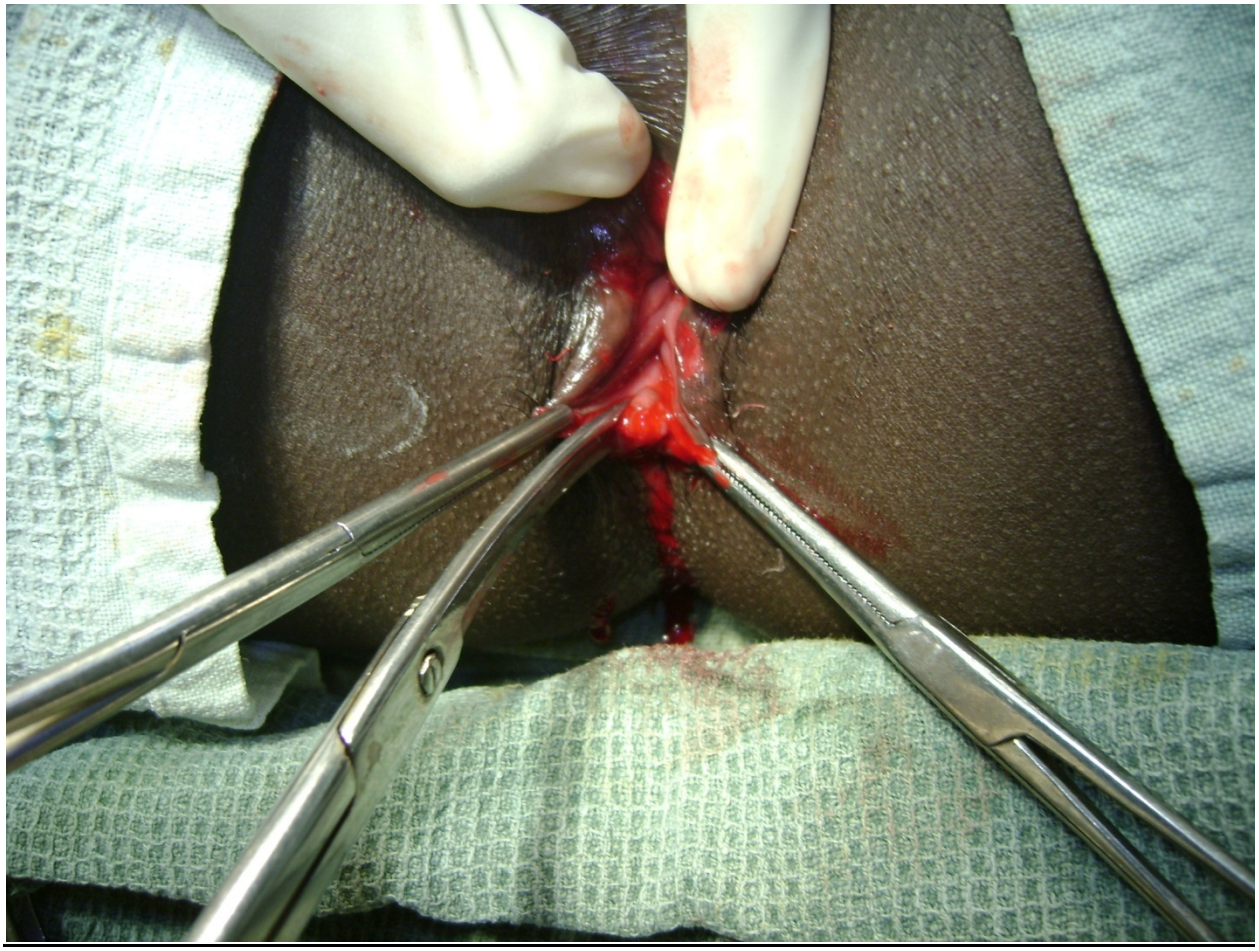
PICTURE 6 : MANUAL ANAL DILATATION



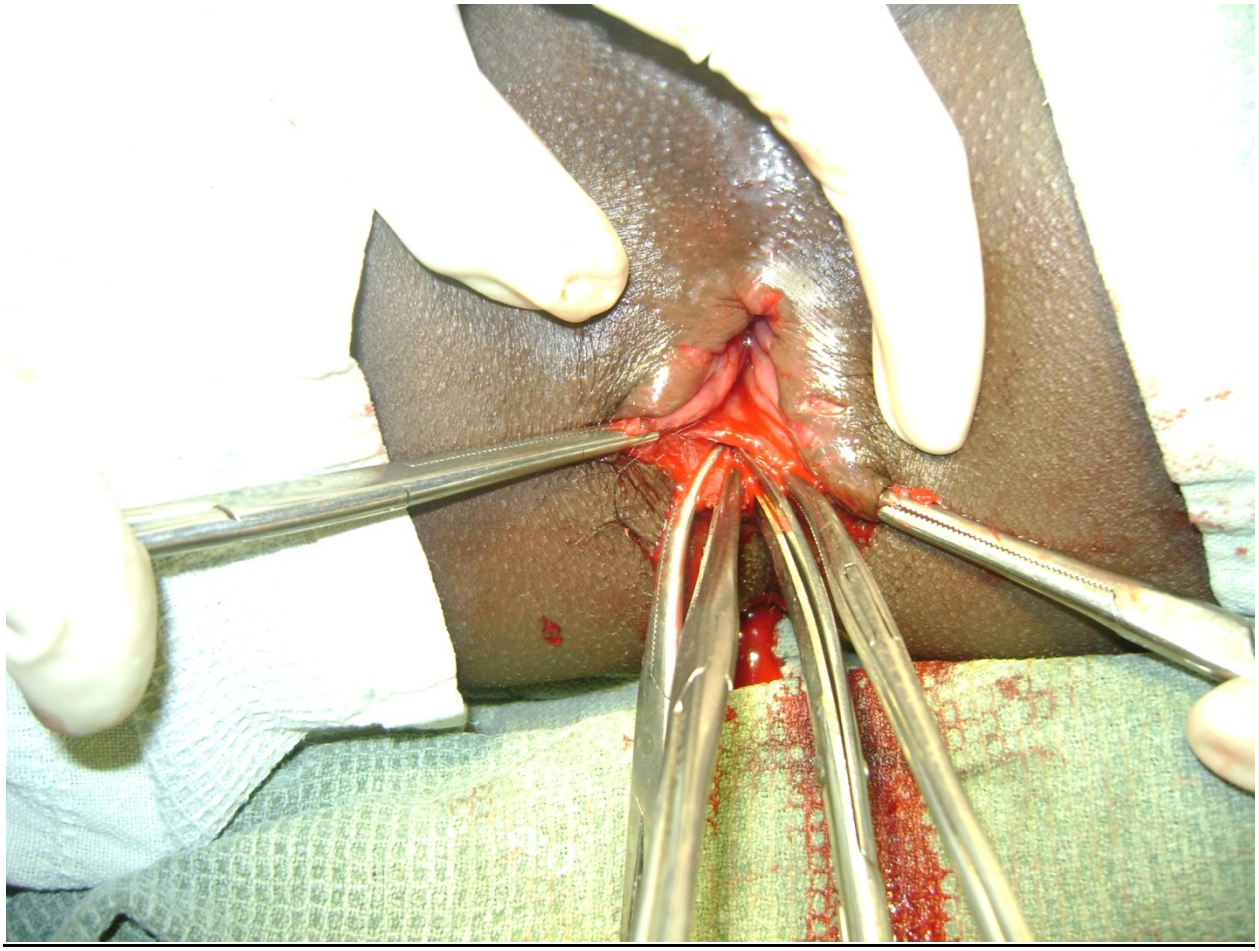
PICTURE 7 a : FISSURECTOMY



PICTURE 7 b : FISSURECTOMY



PICTURE 8 a : LATERAL SPHINCTEROTOMY



PICTURE 8 b : LATERAL SPHINCTEROTOMY

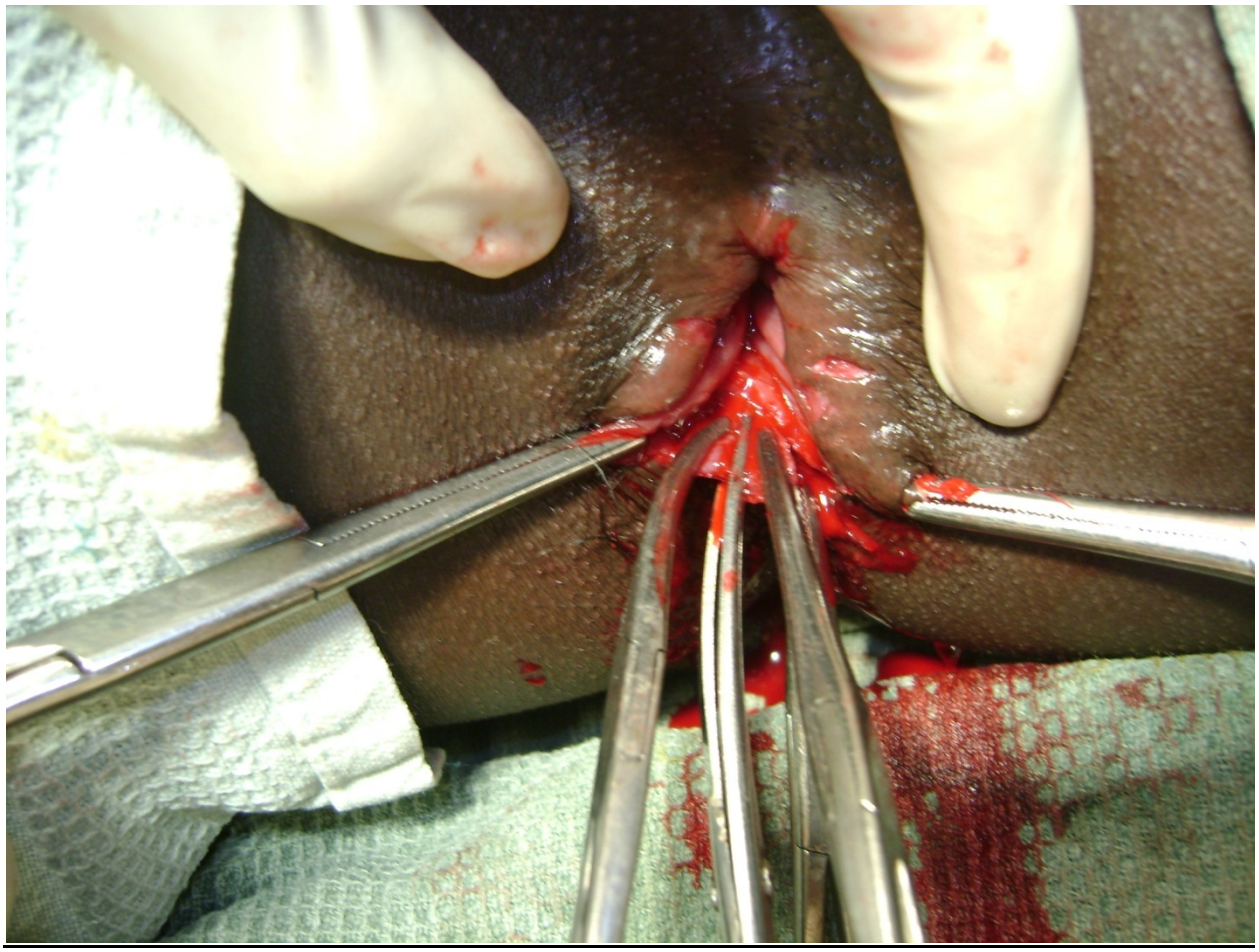


Chart 1 : Distribution of surgeries

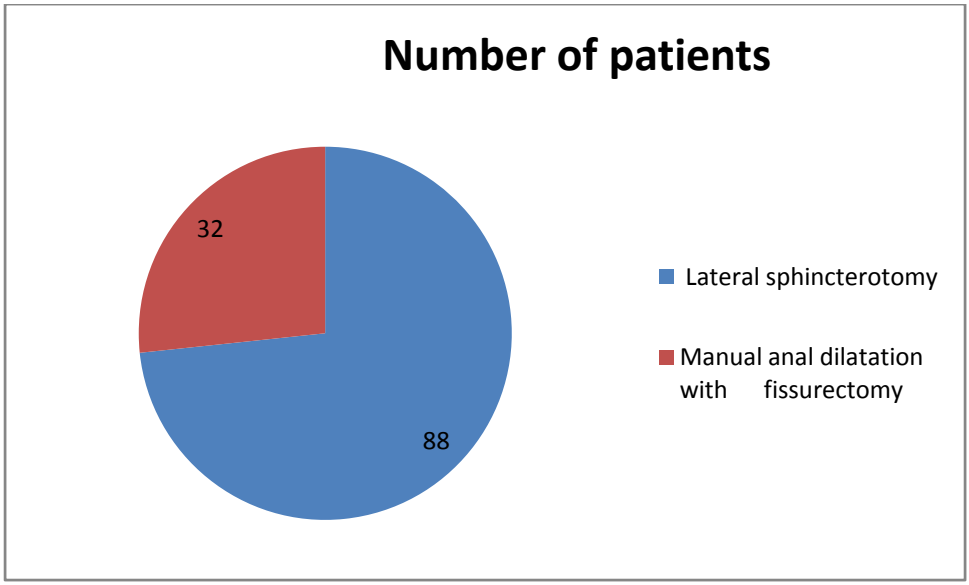


Chart 2 : Age Distribution in the two groups

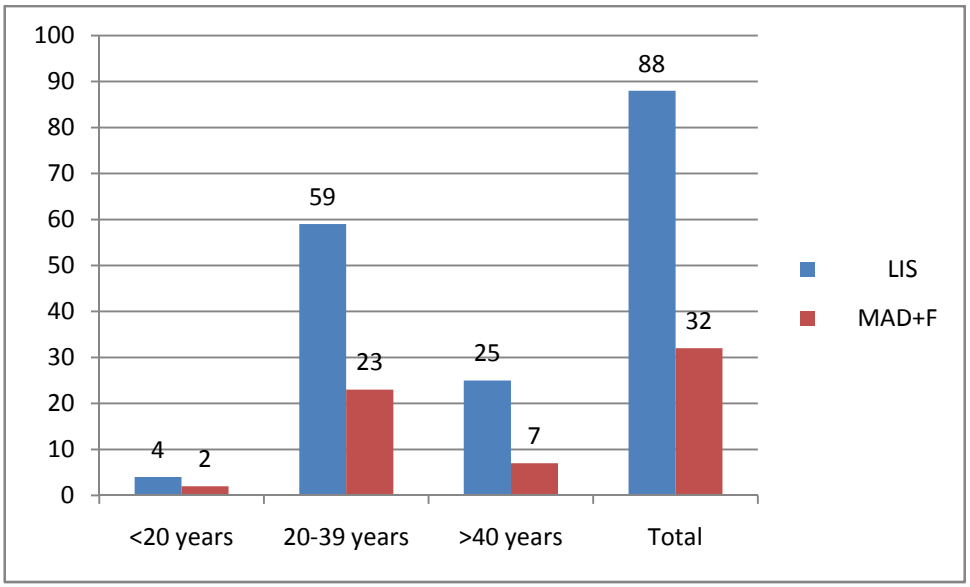


Chart 3 : Sex distribution in the two groups

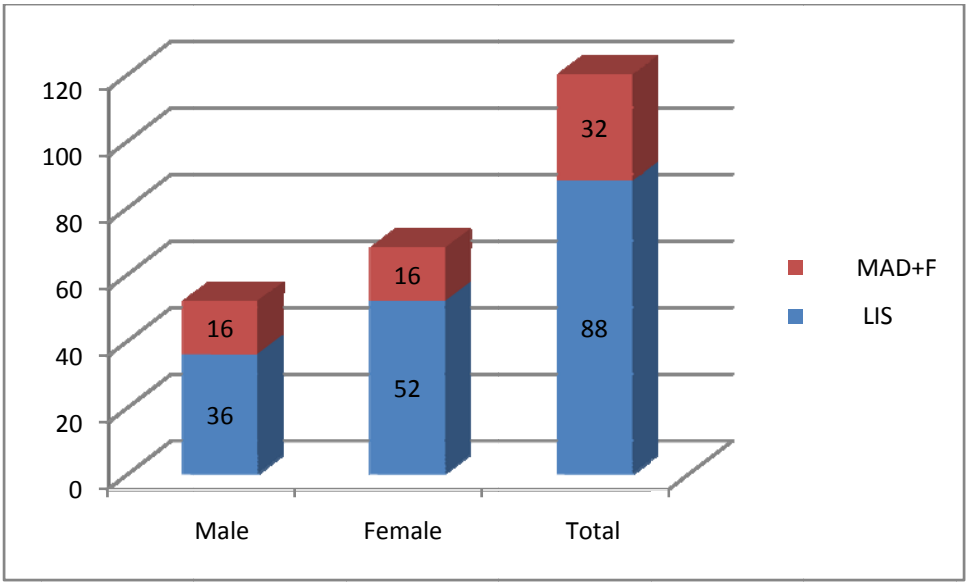


Chart 4 : Distribution of associated diseases in both the groups

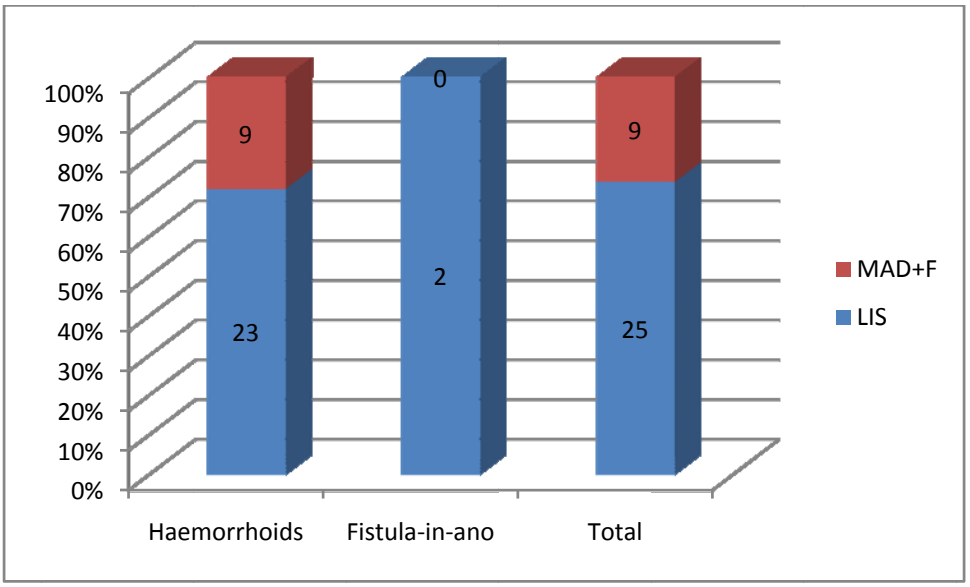


Chart 5 : Pain in both the groups

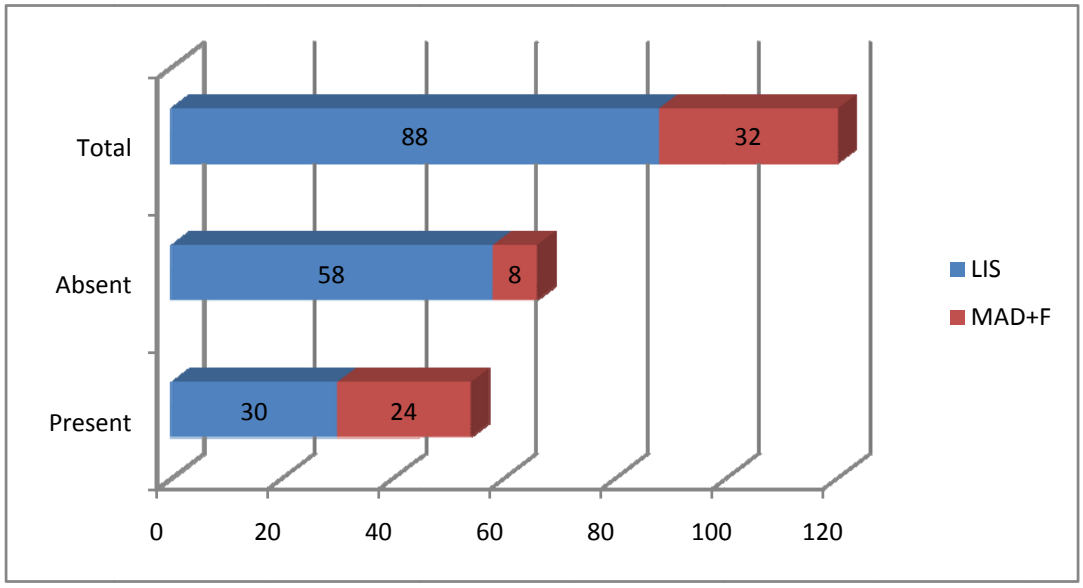


Chart 6 : Bleeding in both the groups

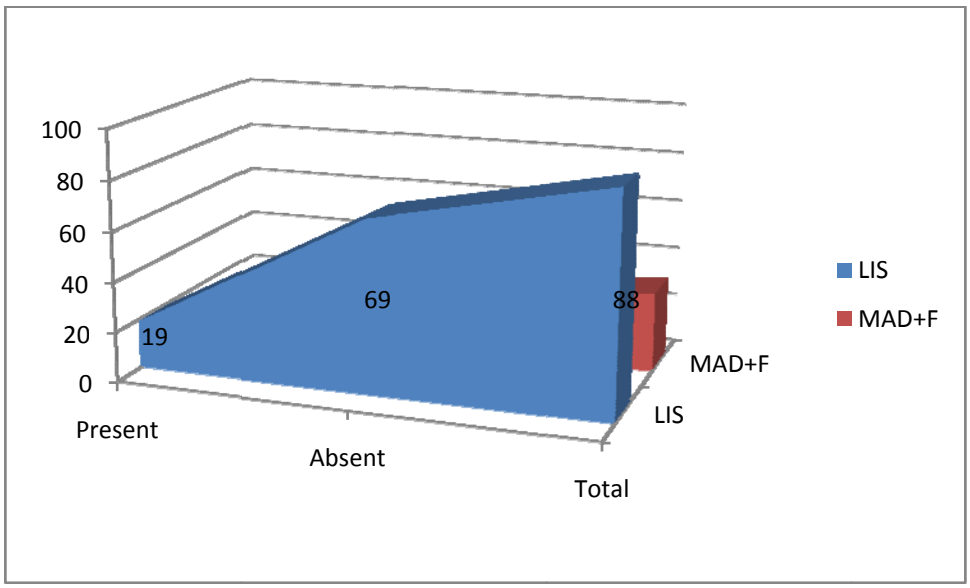
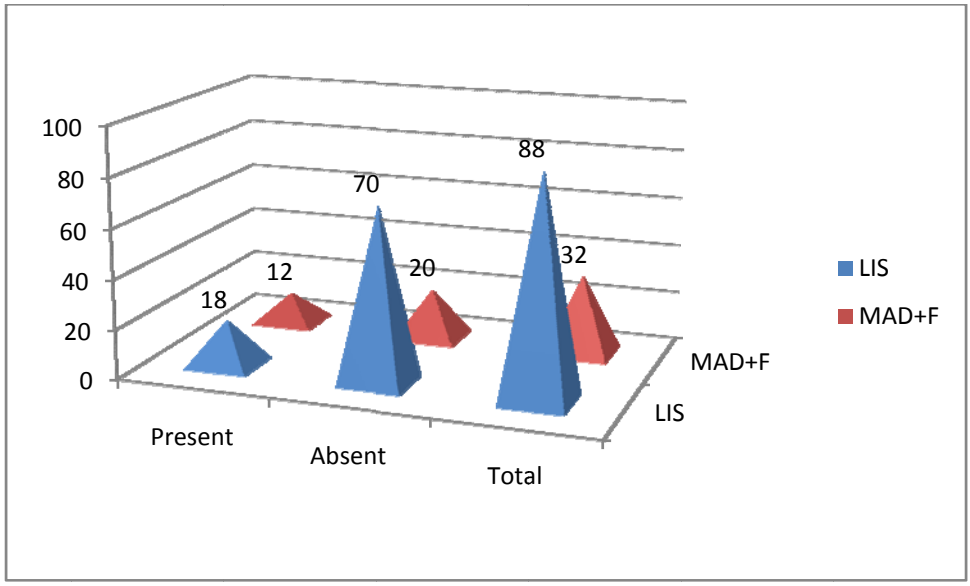


Chart 7 : Retention of urine



ANNEXURE

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BIBLIOGRAPHY

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    b. www.ncbi.nih.in
    c. www.bmj.com

PROFORMA

Name

Age

Sex

Address

Occupation

Income

IP Number

Unit

Date of admission

Date of surgery

Date of discharge

Diagnosis

Procedure done : a. Lateral sphincterotomy (or)

b. Manual anal dilatation with fissurectomy

Post-operative follow-up :

Immediately after surgery :

a. Urinary retention (Yes/No)
b. Persistence of pain (Yes/No)

First week after discharge :

a. Persistence of pain (Yes/No)

b. Persistence of bleeding (Yes/No)

c. Infection (Yes/No)

Two weeks after discharge :

a. Persistence of pain (Yes/No)

b. Persistence of bleeding (Yes/No)

c. Infection (Yes/No)

d. Incontinence to flatus or faecal soiling (Yes/No)

e. Anal stenosis (Yes/No)

Six weeks after discharge :

a. Persistence of pain (Yes/No)
b. Persistence of bleeding (Yes/No)
c. Infection (Yes/No)
d. Incontinence to flatus or faecal soiling (Yes/No)
e. Anal stenosis (Yes/No)
f. Recurrence (Yes/No)

Further follow up:

Any specific complaints

MASTER CHART

S. No	Date	Name	Age	Sex	IP No	Unit	Associated conditions	Procedure	Complications
1	5/6/07	Jayakumar	18	m	23880	S6	-	LS	UR
2	8/6/07	Jayachitra	28	f	27430	S3	-	LS	UR
3	7/7/07	Subramani	29	m	43193	S4	-	LS	P
4	27/7/07	Prabhakaran	25	m	46207	S3	-	MAD+F	P+UR
5	4/8/07	Velumani	38	f	48119	S2	-	LS	-
6	14/8/07	Gopal	24	m	50329	S6	-	LS	P+UR
7	21/8/07	Ramasamy	65	m	50349	S6	-	LS	P
8	18/9/07	Sampath Kumar	30	m	50613	S6	-	LS	P+UR
9	4/10/07	Ilayarasu	21	m	50621	S6	-	LS	B
10	9/10/07	Manikam	45	m	50623	S6	-	LS	-
11	11/10/07	Gunal	17	m	50624	S6	Hae	LS+H	P
12	18/10/07	Ramesh	30	m	61888	S2	Hae	MAD+F+H	P+UR
13	1/11/07	Appu	30	m	65781	S6	-	LS	P

14	18/12/07	Dhana lakshmi	28	f	54059	S4	-	LS	B+UR
15	8/1/08	Binoi Kumar	33	m	810	S6	-	LS	B+UR
16	9/2/08	Selvam	32	m	6786	S4	-	LS	P
17	21/2/08	Radhakri shnan	42	m	8550	S6	Hae	LS+H	-
18	4/3/08	Babu	29	m	11324	S6	-	LS	P+UR
19	14/3/08	Balamani	41	f	13086	S3	-	LS	B
20	20/3/08	Palanisamy	62	m	16731	S6	Hae	MAD+F+H	P
21	8/4/08	Sivalingam	48	m	17082	S4	-	LS	P+UR
22	10/4/08	Palanisamy	35	m	17458	S6	Hae	MAD+F+H	P+UR
23	18/4/08	Saraswathy	39	f	19592	S3	Hae	LS+H	P
24	21/4/08	Jasmine	32	f	19586	S3	Hae	LS+H	B
25	25/4/08	Sumathy	35	f	20965	S3	-	LS	-
26	6/5/08	Vellaiyan	53	m	22971	S6	-	MAD+F	P
27	8/5/08	Surya	20	m	22262	S2	-	LS	B
28	15/5/08	Bargavi	44	f	24335	S6	-	LS	-
29	16/5/08	Bagyalakshmi	33	f	25228	S3	Hae	LS+H	-
30	29/5/08	Udhayakumar	39	m	27222	S6	Hae	MAD+F+H	P+UR
31	2/6/08	Palaniammal	37	f	26583	S3	-	LS	-
32	6/6/08	Selvi	42	f	29468	S3	-	LS	B
33	12/6/08	Krishnasamy	65	m	29275	S2	-	LS	-
34	14/6/08	Bhuvaneshwari	32	f	31075	S4	-	LS	-
35	17/6/08	Bhoopathy	35	m	31079	S4	Hae	MAD+F+H	P+UR
36	21/6/08	Kalyani	55	f	31091	S4	Hae	MAD+F+H	P+UR
37	23/6/08	Banu	30	f	32288	S3	Hae	LS+H	P+UR
38	1/7/08	Saraswathy	25	f	34422	S6	-	LS	-
39	3/7/08	Mariammal	35	f	34401	S6	-	LS	-
40	14/7/08	Ravitha	30	f	36619	S3	-	LS	P
41	15/7/08	Babu	29	m	37269	S6	-	LS	P+UR
42	15/7/08	Maheswari	30	f	37268	S6	-	LS	B
43	17/7/08	Chellammal	58	f	17360	S2	FIA	LS+FI	P
44	17/7/08	Valliyammal	43	f	37242	S6	-	LS	UR
45	18/7/08	Muthumani	21	f	35098	S3	Hae	LS+H	P
46	21/7/08	Kalamani	22	f	38103	S3	-	LS	P
47	22/7/08	Sumathi	23	f	38747	S6	-	LS	B
48	23/7/08	Santhamani	31	m	39090	S1	-	LS	P+UR
49	24/7/08	Shanmugam	40	m	38731	S6	-	MAD+F	B

50	28/7/08	Vijayalakshmi	37	f	37555	S3	Hae	LS+H	P
51	29/7/08	Rangammal	35	f	40129	S6	-	MAD+F	P+UR
52	5/8/08	Krishnaveni	36	f	41329	S6	-	MAD+F	P
53	5/8/08	Ilayaraja	31	m	41351	S6	-	MAD+F	P
54	8/8/08	Mahalingam	34	m	41593	S1	Hae	LS+H	P
55	8/8/08	Rani	32	f	42036	S3	Hae	LS+H	P
56	12/8/08	Krishnaveni	30	f	42591	S6	-	MAD+F	P
57	22/8/08	Parameswari	32	f	44795	S3	Hae	LS+H	B
58	23/8/08	Devendran	59	m	43668	S4	-	MAD+F	P
59	29/8/08	Muniyammal	15	f	46508	S3	-	LS	-
60	1/9/08	Sundarrajan	65	m	46434	S3	Hae	LS+H	-
61	1/9/08	Muniyathal	15	f	46508	S3	-	MAD+F	P
62	13/9/08	Duraiammal	34	f	48481	S2	Hae	LS+H	B
63	26/9/08	Rajan	22	m	52055	S3	-	LS	-
64	16/10/08	Murugesan	28	m	51540	S6	-	MAD+F	P
65	20/10/08	Citheswaran	48	m	56737	S5	-	LS	B
66	21/10/08	Pandaradevan	49	m	56464	S4	-	LS	B
67	23/10/08	Raman	24	m	56784	S6	-	MAD+F	P
68	29/10/08	Ushakumari	30	f	58220	S1	-	LS	-
69	8/11/08	Kanmani	30	f	60438	S4	-	LS	-
70	13/11/08	Poomani	33	f	60827	S6	-	MAD+F	B
71	20/11/08	Arivathal	47	f	62425	S6	-	MAD+F	P+B
72	29/11/08	Subramani	28	m	64120	S4	-	LS	P
73	4/12/08	Chandra	32	f	65103	S6	-	MAD+F	P+B
74	9/12/08	Latha	27	f	66456	S6	-	MAD+F	P+UR
75	12/12/08	Murugavel	29	m	67188	S3	-	LS	P+UR
76	16/12/08	Ravikumar	30	m	67415	S4	-	LS	B+UR
77	22/12/08	Chandra	39	f	69030	S5	-	LS	P
78	30/12/08	Gowriammal	26	f	70358	S6	-	MAD+F	P+B
79	2/1/09	Anandhi	26	f	70825	S1	-	LS	P
80	6/1/09	Saraswathy	37	f	418	S6	-	LS	B
81	7/1/09	Thulasimani	29	f	69485	S1	-	LS	P
82	19/1/09	Kaniyammal	35	f	2576	S5	-	LS	UR
83	20/1/09	Sharavas	22	m	2808	S6	Hae	LS+H	B
84	19/2/09	Rajeswari	46	f	8579	S6	Hae	LS+H	P
85	4/3/09	Soundappan	60	m	10115	S6	FIA	LS+FI	UR

86	11/3/09	Nagajothi	35	f	13295	S1	-	LS	P
87	17/3/09	Kavitha	23	f	14021	S4	-	MAD+F	P+UR
88	24/3/09	Nambiraj	35	m	15772	S6	-	LS	P
89	2/4/09	Parvathi	37	f	17783	S2	-	LS	P
90	7/4/09	Saraswathy	27	f	18284	S4	-	LS	P
91	14/4/09	Nisha	18	f	11370	S6	-	LS	-
92	28/4/09	Thirumalaisamy	39	m	22908	S6	-	LS	B
93	5/5/09	Subbaiyan	60	m	24335	S6	-	LS	B
94	7/5/09	Savithri	31	f	24321	S6	-	LS	B
95	22/5/09	Preethi	20	f	28124	S3	-	LS	-
96	23/5/09	Paramasivam	45	m	28391	S4	Hae	LS+H	-
97	6/6/09	Veni	37	f	31339	S4	Hae	LS+H	-
98	19/6/09	Saraswathy	46	f	34126	S3	-	LS	-
99	25/6/09	Vellaisamy	62	m	31785	S6	Hae	LS+H	-
100	30/6/09	Thangamani	30	f	34836	S6	-	LS	-
101	9/7/09	Bannari	26	f	38089	S6	-	LS	-
102	27/7/09	Saravanan	40	m	40597	S3	-	LS	-
103	28/7/09	Poovathal	39	f	41237	S6	Hae	LS+H	-
104	28/7/09	Sulochana	40	f	41195	S6	Hae	LS+H	-
105	30/7/09	Kalamani	45	f	41222	S6	-	LS	-
106	22/8/09	Mohanraj	51	m	46516	S4	Hae	LS+H	-
107	25/8/09	Gomathi	40	f	47295	S6	-	LS	-
108	29/8/09	Vendamani	31	f	48256	S4	-	LS	-
109	31/8/09	Kathirvel	26	m	46231	S3	-	MAD+F	P+UR
110	8/9/09	Nagarathnam	34	f	50144	S4	Hae	LS+H	-
111	10/9/09	Nagraj	34	m	49899	S6	-	MAD+F	B+UR
112	10/9/09	Maheswari	30	f	49865	S6	-	MAD+F	-
113	12/9/09	Jothi	28	f	50901	S4	Hae	MAD+F+H	P
114	12/9/09	Usha	30	f	50953	S4	Hae	MAD+F+H	P
115	15/9/09	Assan	23	m	51340	S6	-	MAD+F	B
116	15/9/09	Murugan	43	m	51339	S6	-	MAD+F	B
117	26/9/09	Krishnaveni	27	f	53780	S4	Hae	MAD+F+H	UR
118	29/9/09	Deepika	18	f	54178	S6	-	MAD+F	B
119	5/10/09	Alagappan	43	m	54491	S3	Hae	LS+H	UR
120	6/10/09	Sumathi	39	f	55568	S6	-	LS	UR

Abbreviations in the table :

LS - Lateral sphincterotomy

MAD+F - Manual anal dilatation and fissurectomy

Hae – Haemorrhoids

FIA – Fistula – in –ano

H – Haemorrhoidectomy

FI – Fistulectomy

P – Pain

B – Bleeding

UR – Urinary retention

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ETHICS COMMITTEE

CERTIFICATE

Name of the Candidate : Dr. Varun Rajan

Course : M.S. General Surgery

Period of Study : 2007 - 2010

College : Coimbatore Medical College

Dissertation Topic : A comparative study of manual dilatation of anus with fissurectomy versus lateral sphincterotomy in the treatment of chronic fissure in ano.

The Ethics Committee, Coimbatore Medical College has decided to inform that your Dissertation is accepted / ~~Not accepted~~ and you are permitted / ~~Not Permitted~~ to proceed with the above Study.

Coimbatore - 14.

Date : 13.02.08

Secretary
Ethics Committee